

CANADA

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REPORT

OF THE

MINISTER OF PUBLIC WORKS

ON THE

WORKS UNDER HIS CONTROL

FOR THE FISCAL YEAR ENDED JUNE 30

1905

SUBMITTED IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 36  
SECTION 37, OF THE REVISED STATUTES OF CANADA.

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OTTAWA

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EXCELLENT MAJESTY

1906





*To His Excellency the Right Honourable Sir Albert Henry George, Earl Grey,  
G.C.M.G., &c., &c., Governor General of Canada.*

MY LORD,

I have the honour to lay before Your Excellency the Report of the Department of Public Works of Canada, for the Fiscal Year ended June 30, 1905.

I have the honour to be,

My Lord,

Your Excellency's most obedient servant,

CHAS. S. HYMAN,

*Minister of Public Works.*

OTTAWA, March, 1905.



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Huntsville, Ont.		23		188			

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Iona, N.S.		14		34			
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Kincardine, Ont.		23		188, 261			
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Kingston, Ont., harbour.		23		261			
" " graving dock		23		307		7, 15	
" " public building		10, 32	18				
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Lake Manitoba, "		24		299			
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" " public building		8, 31					
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PART I

REPORT

OF THE

DEPUTY MINISTER OF PUBLIC WORKS

FOR THE YEAR ENDED JUNE 30

1905



# REPORT

OF THE

## DEPUTY MINISTER OF PUBLIC WORKS

FOR THE FISCAL YEAR, 1904-05.

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DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, March 7, 1906.

To the Honourable C. S. HYMAN,  
Minister of Public Works of Canada,  
Ottawa, Ont.

SIR,—I have the honour to submit the report of the Department of Public Works of Canada for the fiscal year ended June 30, 1905.

It contains, as usual, an extended review of all the works executed during the fiscal year, with, in addition, the annual financial statement of the Accountant, a report by the Collector of Revenue and other appendices referring to the work carried on by the department.

The total expenditure in all services during the year 1904-05 has amounted to the sum of \$8,304,009.77, compared to \$6,592,289.62 for the preceding year, and \$5,830,518.11 for the year 1902-03.

Those figures show the material increase in the number of works under the control of the department and indicates that, notwithstanding the fact that the superintendence of the ship channel between Montreal and Quebec no more devolves upon the Department of Public Works, the balance of the work under its control not only has not been reduced but, on the contrary, has been materially increased.

As was remarked in my report of last year, a wonderful development continues to take place in every branch of the department; the number of harbours, for the improvement of which Parliament had provided moneys, has increased steadily; the dredging operations have covered a much larger navigable area than in any previous year, while the buildings under the control of the Chief Architect have been of a higher class and much greater in number.

It follows, therefore, that the correspondence work of the department, and especially that under the control of the Secretary has had to keep pace with the increase in the actual technical work. The statement of the correspondence shows a large addition to the number of letters sent and received, although it does not include the corre-

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pondence of the Minister on purely departmental matters, such correspondence not being taken into account in the statement published at the end of this volume.

In his report of the preceding year the Accountant, making a comparison between the year 1899-1900 and the year 1903-04, showed that the number of departmental cheques issued in the former year had been about 22,000, whilst in the latter year that number amounted almost to 45,000. For the year 1904-05, the number of cheques, inclusive of those issued upon direct application to the Department of Finance, comes to the total, according to the Accountant's statement, of 56,144.

The expenditure made during the last fiscal year, as above referred to, may be subdivided as follows as compared with the preceding year :—

	1904-05.	1903-04.
Harbour and river works. . . . .	\$2,493,371 24	\$3,389,936 02
Dredging and plant. . . . .	1,458,865 25	374,181 94
Slides and booms. . . . .	195,358 95	127,549 37
Bridges and roads. . . . .	94,348 13	103,759 29
Public buildings. . . . .	3,067,415 65	1,890,281 77
Telegraphs. . . . .	462,064 36	385,693 51
Miscellaneous . . . . .	532,586 19	220,887 72
Totals. . . . .	\$8,304,009 77	\$6,492,289 62

The revenue collected by the department during the year under review has been a trifle in excess of the preceding year, the several items as reported by the Collector being as follows :—

	1904-05.	1903-04.
Slides and booms. . . . .	\$ 82,873 97	\$ 71,331 20
Graving docks. . . . .	24,754 30	32,444 56
Locks. . . . .	Nil.	140 60
Rents. . . . .	4,303 00	4,034 50
Telegraphs. . . . .	139,758 44	147,391 94
Casual revenue. . . . .	28,663 96	18,695 97
Totals. . . . .	\$280,353 67	\$274,038 77

## HARBOURS AND RIVERS.

The extensive report of the Chief Engineer, published herein as appendix 4, contains a reference to each of the works undertaken under his control, as well as a list of all the surveys which have been made preparatory to the works of construction.

The total amount given in the Accountant's report of the expenditure of this branch does not, and cannot, give any complete idea of the work actually performed, as in connection with a number of the items voted, only a preliminary expenditure has been made with a view to the preparation of plans and specifications for the purpose of calling for tenders. This explains why the long and tedious labours

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of the engineers in obtaining that preliminary information can hardly be chronicled otherwise than by the very brief mention of the places at which the survey was made, the expenditure for such survey being defrayed out of the general vote for that purpose and therefore not appearing at all under the name of the work in the Accountant's statement.

Of such surveys, the number for the present year has been 376, as against 238 for the year previous and 281 during the year 1903-04.

This reference to surveys does not include that now in progress to obtain the necessary data concerning the projected canal from the waters of the Georgian bay, to the St. Lawrence at Montreal.

The report of the Chief Engineer not only gives important information with reference to the class, nature, extent and cost of each work executed under his control, but also refers to the dredging operations which have been performed by the department throughout Canada.

It may here be remarked that when the control of the ship channel between Montreal and Quebec was given over to the Department of Marine and Fisheries, the largest part of its dredging fleet also went to that department at the time of the transfer. The other dredges, owned by the department and operating in the several provinces, were also getting old and out of date. During the year under review, the department has proceeded with the, already commenced, improvement of its dredging fleet by the renewal in some cases of the hulls of the dredges, their enlargement, the overhauling of their machinery and, in several cases, by the construction of entirely new plant. In this manner a new snag-boat has been constructed for the province of British Columbia, while steps have been taken to procure towing plant both for the province of British Columbia and the province of Manitoba. For the province of Ontario, a new hydraulic dredge is under construction in the building yards of 'The Polson Iron Works Company,' while another hydraulic dredge, as well as a spoon dredge, are also being constructed, the former for the Maritime Provinces generally, and the latter for the province of Prince Edward Island, to replace the old 'Prince Edward,' which has been in use in that province ever since it joined confederation in 1872.

The new dredge, the 'W. S. Fielding,' has been put in commission during the past summer and was successfully navigated to Yarmouth, N. S., where she will be placed at work during the next season. She was constructed and equipped at the government ship yard at Sorel, Quebec.

The improvement and enlargement of the dredging fleet of the department is a necessity which is apparent to any one who has given any study to the conditions of the transportation and general trade in this country. The class of vessels navigating our great lakes and rivers, and calling at our principal ports, is becoming larger both as regards size and draft, and the old standard depth which had been provided in most of the harbours and rivers is now found to be insufficient for those vessels. The necessity for additional dredging is being felt at the same time all over the navigable areas of the country, and while Parliament has been very generous in providing

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the means required for that purpose, still it has been difficult, even when calling into service the reserve of dredges owned by private individuals and companies, to execute at the proper time the dredging most needed.

The great improvements which are now outlined, and which will be rendered obligatory by the increase in the cereal products of the great west, and the great enlargement of the railway carrying facilities, will necessitate dredging of greater magnitude and of a more urgent nature in the years to come. Those requirements will tax to the utmost the capacity of all the dredging vessels either possessed by the state or by private individuals.

The report of the Chief Engineer contains a special chapter concerning dredging. It gives in detail the work of each dredge employed, the nature of the soil removed, the depth which has been procured and the cost per yard of each class of dredging.

In the section concerning the harbours most particularly, a description is given of all works performed, whether by contract or by day labour. It will be seen that the former course has been selected at all points where it was practicable to do so, and where it was thought that rapidity of work and cheapness would be better ensured by having the work done by contract.

Harbour works are being performed throughout Canada at over 160 different points, while dredging was carried on at over 60 points in the Dominion.

I am happy to note here the appointment of Mr. E. D. Lafleur, as Chief Engineer of the department, after a service of over 20 years as engineer, during eight of which he occupied the position of Acting Chief Engineer. His appointment as Chief Engineer was made by an Order in Council of January 7, 1905.

### PUBLIC BUILDINGS.

This branch of the service, which, as shown by the statement above given, has expended \$3,067,415.65, as compared with \$1,890,281.77 in the preceding year, has, as usual been administered, in his well known successful manner, by the present Chief Architect, Mr. D. Ewart. Not only has the number of buildings to be constructed and supervised been largely in excess of the past year, but the buildings commenced during the year have been in themselves the most important since the construction of the Langevin block and, that of the Parliament and departmental buildings in this city. It is during the year under review that the department has commenced the construction of the new Victoria Museum in the city of Ottawa, of the Mint and Archives buildings, also in Ottawa, of a new post office in Winnipeg, of a new public building in Vancouver, and of large military buildings throughout the various provinces.

The report of the Chief Architect shows in detail the nature and value of the work performed, the number of new buildings for which contracts have been made, including those above mentioned and the military buildings, being twenty-six and six new buildings having been entirely completed during the year.

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The extensive repairs to the Ottawa Post Office are almost completed, there remaining only the interior fittings to be placed in position, and contracts for these have been entered into at the date of the writing of this report.

In addition to the construction of new works, plans and specifications have been prepared for quite a number of buildings which will be commenced during the current fiscal year, and will be made the subject of next year's report.

Furthermore, the ever increasing number of buildings has caused additional work in connection with the maintenance and repair to the existing ones, coupled with the supervision of their heating, lighting and water services. All those works keep a large force of architects and draughtsmen well employed under the direction of the Chief Architect, their work during the past year having been eminently satisfactory.

## TELEGRAPHS.

The telegraph service of the department has remained about the same as noticed in the previous year's report, only a few lines of not very great extent having been constructed along the shore of the River Saguenay and some extension of existing lines having been made in Cape Breton Island and in the North-west Territories. The number of miles of telegraph lines now owned and controlled by the Department of Public Works amounts to 6,590.

The attention of the public has very often been called to the fact that it has never been the policy of the government of Canada ever since the first government line was built in 1886, to the present date, to construct or maintain those lines as a paying investment. They have been, in mostly all cases, constructed between points where, although the necessities of trade required modern means of communication, still the volume of that trade and the sparse population of the country traversed could not ensure those local returns which would enable a surplus of revenue to be shown over expenditure, or at least a balance between one and the other. The construction of these lines has however rendered a national service; those, for instance, on the north shore of the St. Lawrence, between the Labrador country and Quebec, having been of incalculable help and benefit, not only to fishermen plying their avocations on either shore of the Gulf of St. Lawrence, but also to the pioneer establishments which have sought a home in several sections of the hitherto uninhabited country from the River Saguenay to the east. In the same way, the lines constructed in British Columbia and the line which has, for the past six years, kept the Yukon district in touch with the rest of Canada and of the civilized world have been of great use and benefit to the country.

None of those lines would probably have been constructed by private companies, whose shareholders look first to profitable returns and are not always moved by philanthropic ideas and the desire to benefit the country at large.

The conferring of that benefit is a duty which devolves upon the central government, and the several administrations which have controlled the country from 1886 to the present date, have practically followed the same policy and given telegraphic communication in a field it was not probable that private companies would ever enter.

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It is somewhat a difficult matter to state whether or not it would be possible to have these government lines less expensive in management and produce greater returns. The very wildness of the country where these lines are built, the difficulty of traversing them, their exposed situation, &c., make their maintenance more difficult, the repairing stations having to be nearer one to the other, the manning of those stations having to be greater and the very isolation of the repairers and operators engaged upon the work, making it necessary to compensate those employees in a more liberal manner in the payment of their salaries.

It is however with a great degree of satisfaction that the department is able to report that all its lines have been in a fair state of maintenance and operation during the year under review, although there is a tendency to a diminution in the revenue of the Yukon line. This reduction is largely due to the construction by the United States government, under its signal service, of land lines and cables in Alaska, consisting of a series of land lines from Nome to Valdez, and a cable system connecting all the important points in south-eastern Alaska with the telegraphic network of the United States. A large proportion of the telegraph business which used, before the construction and completion of the United States system, to be handled by our Yukon line is now sent via the other lines, as is shown by the number of messages handled by them, which during the past year have amounted to 134,630.

In the case of the United States telegraph lines, as well as in our case, the Alaskan communication is far from being made a paying investment and in his report for the year 1905, the Secretary of War, states that 'as a matter of fact the cost of operation and maintenance is and probably will be for years greater than the receipts.' In his remarks as to the future of the lines, the Secretary of War makes the statement that 'no private corporation can efficiently maintain and operate the land lines.'

It is also pointed out in that report that the great cost of maintaining that communication is still somewhat smaller than it might otherwise be, by reason of the fact that the whole of the Alaskan system of telegraph communication is under the control of the Army corps through its signal branch and that the men in charge of the stations received the small pay of from \$13 to \$54 per month with rations, in a country where day labourers earn from \$4.50 to \$10 per day, in some cases with board, and skilled labourers earn from \$10 to \$15 per day. We unfortunately are not so well favoured as regards the small cost of our staff, and had the United States government to engage their personnel in the open field instead of recruiting it from the ranks of their regular army the showing of their balance sheet would still be less satisfactory. The report concludes by stating that in the event of the sale or transfer of the lines, to private interest, such would unavoidably be accompanied by higher tariffs.

The report of the General Superintendent of our telegraph lines contains the usual statement as to the names, locations and number of stations, the names and salaries of superintendents, repairers, operators, &c., the location and length of lines and cables and a financial statements as to revenue and expenditure.



## GEORGIAN BAY CANAL SURVEY.

In a separate appendix to this volume will be found a progress report from Mr. Arthur St. Laurent, engineer in charge of the survey, on the progress made during the year under review. The report is accompanied by appendices containing statements by each of the district officers in charge, under his direction, and gives rather important and complete information as to the organization of the survey, the progress it has made and the expectation of completion within the next year; I will not attempt to review Mr. St. Laurent's report, inasmuch as the whole of it requires to be read, if the nature of the work performed up to the present day is to be well understood. The report is concise, to the point, and without arriving yet at any conclusions, will permit the reader to realize the vast amount of work, as well as the accuracy of information given, upon the field which is being covered. The engineers employed are among the best the country possesses and it is a source of gratification that they are the product of Canadian teaching, Canadian schools and Canadian experience, and well able to cope with all the difficulties surrounding this important work.

## COMMISSIONS.

The reports of the Transportation and International Waterways Commissions are published separately and will not be found in this book, although they are treated as proper appendices to this report.

With the report submitted by the Transportation Commission to the Minister in December last, the labours of that body may be considered to be completed. It is not within my province to do more than indicate its presentation, as it will probably be in the hands of the public at the same time as this report to you will be.

It contains among the mass of information which is being conveyed by the Commission, certain recommendations which touch upon matters of policy and which will no doubt form the subject of interesting discussions when the report is placed before the House. Whether all of its recommendations will be considered acceptable, is a question which will be later on decided, but whether they are accepted or not, their presentation in the report is made in a way which is bound to call forth an interesting discussion as to their value and cannot fail to be ultimately of great advantage to the important question to which they refer. As established at the time of the writing of the report, the Commission was composed of Mr. Reford, as chairman, Mr. J. H. Ashdown, as member, and Mr. C. N. Bell, as secretary; the first chairman, Mr. John Bertram, as well as the French Secretary, Mr. Perrault, having died during the course of the past year; the latter was not replaced.

Another of the appendices of this report, which will be published separately, is the progress report of the International Waterways Commission, established in January, 1905.

Matters of great importance have and will come before the Commission for study, but the scope of their work has been somewhat restricted by the claim brought forward by the government of the United States that their labours should not go outside

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of the waters absolutely adjoining the boundary between the United States and Canada. The position taken by Canada, and by the Commission, was clearly set forth in a report made by you to Council and communicated to the government of the United States, but in order to permit of certain other matters of great importance being considered, the Canadian section of the Commission was allowed to proceed for the time being in accordance with the view taken by the United States government, there being an understanding that at the ensuing session of Congress, action would be taken for the proper legal extension of the Commission's powers in the direction indicated by Canada.

The interim report of the Commission contains all the Orders in Council and various communications between the United States and Canadian sections of the Commission, as well as with the Secretary of State for the United States, in reference to the scope of the Commission. It also contains records and minutes of the meetings and of their labours connected with the utilization of boundary waters at two of the most important points in both countries, namely: Sault St. Marie and Niagara. The latter question is one which is given considerable attention, in the northern part of the American continent; the claim being advanced and well worthy of consideration that the value of the falls from a scenic and panoramic point of view is fully worth preserving even when weighed alongside of the great commercial worth of the development of power which has taken place there during the past few years.

#### MISCELLANEOUS.

In addition to the matters above referred to, the other appendices attached to this report will be found, as usual, complete, those referring to purchase and sale of property, lands leased by and to the department, contracts let, the Art Gallery, officials, &c., &c., being well worthy a perusal.

Before concluding this report, I may say that I have strong hopes that the review of the work of the department for the past twenty years, on which I have been labouring for some time and which is in some respects completed, and in others rapidly nearing completion, will be issued during the course of the coming summer.

I beg to offer the expression of my utmost satisfaction to all the employees of the department who have assisted in carrying on, so successfully, the very important works entrusted to them and to myself during the year under review, and I must say that they all deserve the greatest praise for the manner in which they have acquitted themselves of their duties.

I have the honour to be, sir,

Your obedient servant,

A. GOBEIL,  
*Deputy Minister.*

PART II

REPORT OF THE CHIEF ACCOUNTANT

FOR THE

FISCAL YEAR ENDED JUNE 30

1905



DEPARTMENT OF PUBLIC WORKS, CANADA,  
ACCOUNTANT'S OFFICE,  
OTTAWA, January 20, 1906.

A. GOBEL, Esq.,  
Deputy Minister,  
Department of Public Works,  
Ottawa.

SIR,—I beg to submit the annual report upon the expenditures made by this department during the fiscal year ended June 30, 1905.

As in previous years the report takes the form of three tabular statements, as follows :—

*Statement A*, giving for each work the amounts expended for construction and repairs severally, and for each province the total cost of staff and maintenance of public buildings.

*Statement B*, subsidiary to the above and giving separately for each building the cost of rent, salaries, heating, &c.

*Statement C*, showing amounts advanced by government for the construction of certain works of a semi-public character, under statutory authority and after inspection by officers of this department. There having been during 1904-05 no transactions of this nature, statement C is included only for the purpose of preserving continuity of form.

Notwithstanding the fact that one of the largest works formerly under the charge of this department, namely, the deepening of the St. Lawrence ship channel was transferred to another department on June 30, 1904, the total expenditure during the year 1904-05 has exceeded that of the previous year by more than 27 per cent as follows:—

Total expenditure 1904-1905.. . . . .	\$8,304,009 77
“ “ 1903-1904.. . . . .	6,492,273 52
Increase.. . . . .	<u>\$1,811,736 25</u>

An examination of that part of statement A, which treats of public buildings, will show that the chief increases, under this head, are due to the following items of construction or enlargement:—

Court Houses, &c., at Edmonton and Prince Albert.  
Custom Houses, &c., at Halifax, Montreal and Toronto.  
Drill Halls, &c., at Woodstock, N.B., Quebec, Que., Brantford, Cobourg, Hamilton, London, Statford, St. Catharines and Woodstock, Ont., and Rossland, B.C.  
Immigration Buildings at Halifax, Quebec (including trachoma hospital) and Winnipeg.  
Postal Stations, including pneumatic tube distribution systems at Montreal and Toronto.  
Post Offices at Ottawa and Winnipeg.  
Quarantine Stations, at St. John, N.B., Quebec, Que., and Williams Head, B.C.

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Also the following at Ottawa :—

Astronomical Observatory, Addition to Western Departmental Building.  
Addition to Printing Bureau, Improvements in Parliament Building,  
New Workshops, Royal Mint.

Under harbours and rivers, the increase of expenditure is found to have been almost evenly distributed over a large number of works in each of the provinces. The undermentioned are a few of the more notable ones :—

Quebec, Que., Collingwood, Fort William and Port Arthur, Ont., and the Survey for a waterway from Georgian Bay to Montreal, the latter classed in statement A under the heading of miscellaneous.

As regards the operations of the branch of the department under my charge, I may be permitted to say that a slight increase in the staff together with some minor improvements in organization have effected a considerable betterment in the speed with which the business of the branch has been despatched.

The volume of work passed through the branch during 1904-05 may be briefly indicated as below :—

	Number of cheques issued.	Amount.
		\$ cts.
Direct payments by departmental cheque—		
Issued by head office, Ottawa .....	46,340	4,491,676 63
" agencies .....	9,058	645,280 73
Total departmental cheques .....	55,398	5,136,957 36
Payments by Receiver General's cheque after applications issued by this office upon the Auditor General (contract work, &c.) .....	746	3,167,052 41
Total expenditure .....		8,304,009 77

I have the honour to be, sir,

Your obedient servant,

A. G. KINGSTON,

*Accountant.*

# STATEMENTS OF EXPENDITURE

DURING

FISCAL YEAR ENDED JUNE 30, 1905





STATEMENT A.—Showing the Amounts Expended by the Department of Public Works of Canada during the Fiscal Year ending June 30, 1905.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>PUBLIC BUILDINGS.</b>				
<i>Nova Scotia.</i>				
Amherst post office, &c. . . . .	1,689 30	19 20		1,708 50
Annapolis post office, &c. . . . .		101 69		101 69
Antigonish post office, &c. . . . .	642 97	18 26		661 23
Baddeck post office, &c. . . . .		5 00		5 00
Canso post office . . . . .	246 74			246 74
Dartmouth post office, &c. . . . .		29 82		29 82
Digby post office, &c. . . . .	797 17	35 90		833 07
Glace Bay post office . . . . .	6,600 00			6,600 00
Guysboro', post office, &c. . . . .		40 27		40 27
Halifax, Asst. Receiver Gen. Office . . . . .		65 00		65 00
" custom house (new) . . . . .	71,963 71			71,963 71
" Dominion building . . . . .		5,819 39		5,819 39
" immigrant shed . . . . .	11,008 10	1,974 73		12,982 83
" Lawlor's Island quar. station . . . . .	3,214 70			3,214 70
Kentville, post office, &c. . . . .		23 00		23 00
Liverpool post office, &c. . . . .		40 71		40 71
Lunenburg, post office, &c. . . . .		60 58		60 58
Middleton armoury . . . . .	201 69			201 69
Nappan experimental farm . . . . .	300 52	100 81		401 33
New Glasgow, post office . . . . .		82 75		82 75
North Sydney, post office . . . . .	3,167 40	434 09		3,601 49
" quarantine station . . . . .		320 09		320 09
Pictou custom house . . . . .		996 09		996 09
" post office . . . . .		1,267 26		1,267 26
" quarantine station . . . . .		521 75		521 75
Shelburne, post office . . . . .	20 00			20 00
Springhill, post office, &c. . . . .		77 80		77 80
Sydney, post office, &c. . . . .	16,553 78	70 63		16,624 41
Sydney Mines, post office, &c. . . . .	14,138 59			14,138 59
Truro, post office, &c. . . . .	102 73			102 73
Windsor, post office . . . . .	28 90			28 90
Yarmouth, post office, &c. . . . .	2,592 25	59 88		2,652 13
Heating, lighting, water, &c., for all buildings in Nova Scotia (for details, see page 30) . . . . .			31,313 03	31,313 03
Totals, Nova Scotia . . . . .	133,268 55	12,164 70	31,313 03	176,746 28
<i>Prince Edward Island.</i>				
Charlottetown, Dominion building . . . . .	8,948 24	883 88		9,832 12
Montague, post office . . . . .		9 74		9 74
Souris, post office . . . . .	1,107 11			1,107 11
Summerside, post office . . . . .		168 86		168 86
Heating, lighting, water, &c., for all buildings in Prince Edward Island (for details, see page 30) . . . . .			6,062 01	6,062 01
Totals, Prince Edward Island . . . . .	10,055 35	1,062 48	6,062 01	17,179 84
<i>New Brunswick.</i>				
Bathurst, post office, &c. . . . .	1,165 15			1,165 15
Campbellton, post office, &c. . . . .	7,949 11			7,949 11

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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
<b>PUBLIC BUILDINGS—Continued.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
<i>New Brunswick—Con.</i>				
Carleton (St. John), post office.....		141 41		141 41
Chatham, post office, &c.....		256 36		256 36
Dalhousie, post office, &c.....		43 36		43 36
Dorchester, custom house.....		25 80		25 80
Fredericton, post office, &c.....		286 82		286 82
“ drill hall.....	3,839 66			3,839 66
Marysville, post office.....		110 40		110 40
Moncton, post office.....		285 81		285 81
Newcastle, post office.....		179 98		179 98
Partridge Island, quarantine station.....	52,795 76			52,795 76
Portland (St. John), post office.....		75 00		75 00
Richibucto, post office.....	5,122 73	11 90		5,134 63
St. John, custom house.....		1,794 98		1,794 98
“ immigration building.....	1,747 95			1,747 95
“ post office.....		763 33		763 33
“ savings bank.....		126 17		126 17
St. Stephen's, post office, &c.....		343 50		343 50
Sussex, armoury.....		3 00		3 00
“ post office, &c.....		234 08		234 08
Tracadie, lazaretto.....	1,315 00	619 62		1,934 62
Woodstock, armoury.....	13,263 96			13,263 96
“ post office, &c.....		116 08		116 08
Heating, lighting, water, &c., for all buildings in New Brunswick (for details see page 30.).....			28,099 73	28,099 73
Totals, New Brunswick.....	85,451 37	7,165 55	28,099 73	120,716 65
<i>Maritime Provinces.</i>				
Generally.....			1,253 20	1,253 20
<i>Quebec.</i>				
Acton Vale, post office.....	11,993 26			11,993 26
Aylmer, post office.....		116 93		116 93
Berthierville, post office.....		128 19		128 19
Buckingham, post office, &c.....		419 60		419 60
Chicoutimi, post office, &c.....	3,280 33			3,280 33
Coaticook, post office, &c.....		77 10		77 10
Drummondville, post office, &c.....		47 42		47 42
Granby, post office, &c.....	999 97	18 75		1,018 72
Grosse Isle, quarantine station.....	20,900 00			20,900 00
Fraserville, post office, &c.....		1,179 69		1,179 69
Hochelaga, post office.....	1,612 13	61 91		1,674 04
Hull, post office, &c.....		362 00		362 00
Joliette, post office, &c.....	1,810 87	83 23		1,894 10
Lachine, post office.....		533 24		533 24
Lachute, post office, &c.....	1,206 80			1,206 80
Laprairie, post office, &c.....		467 71		467 71
L'Assomption, post office, &c.....		660 17		660 17
Lévis, cattle quarantine.....		140 86		140 86
“ post office, &c.....	2,445 69	311 50		2,757 19
Longueuil, post office, &c.....	6,217 30			6,217 30
Montmagny, post office, &c.....	2,349 60	16 10		2,365 70
Montreal, custom house.....	5,170 68			5,170 68
“ examining warehouse.....	31,917 26	110 37		32,027 63
“ immigration office.....	71 65			71 65
“ inland revenue office.....	2,167 50	413 98		2,581 48
“ post office.....	5,027 28	3,850 24		8,877 52
“ power for elevators.....			2,717 70	2,717 70

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS— <i>Continued.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Quebec—Concluded.</i>				
Montreal, pneumatic tube system between G. P. O. and new postal stations.	42,106 36			42,106 36
“ new postal station (St. Catherine St.)	50,116 89			50,116 89
Quebec, citadel buildings		2,250 48		2,250 48
“ clerk of works office, P.O.		215 34		215 34
“ culler's office		267 65		267 65
“ custom house		1,700 16		1,700 16
“ drill shed	20,220 64			20,220 64
“ examining warehouse		933 85		933 85
“ King's wharf building, (Marine Dept)	669 90	612 07		1,281 97
“ immigration building (Louise em- bankment)	12,063 20			12,063 20
“ “ hospital for trachoma	27,438 50			27,438 50
“ observatory		1,282 33		1,282 33
“ post office		4,147 32		4,147 32
“ “ power for elevator			200 00	200 00
“ military buildings :				
“ Dominion arsenal	224 85			224 85
“ Artillery workshops	199 45			199 45
“ Iron foundry	3,184 75			3,184 75
“ St. Roch post office		1 00		1 00
Peribonka, immigrant shed		84 42		84 42
Richmond, post office, &c.		239 10		239 10
Rimouski, post office, &c.		25 64		25 64
Roberval, immigration shed		55 78		55 78
Sherbrooke, drill hall	309 00			309 00
“ post office, &c.	1,999 89	142 22		2,142 11
Sorel, post office, &c.		601 61		601 61
St. Henri, post office		365 01		365 01
St. Hyacinthe, drill hall	14,994 40			14,994 40
“ post office, &c.	13,699 77	190 23		13,890 00
St. Jérôme, post office, &c.		85 43		85 43
St. John's, post office, &c.	2,626 29	60 00		2,686 29
St. Louis du Mile End, post office	16,001 65			16,001 65
Terrebonne, post office, &c.	6,339 41			6,339 41
Thetford Mines, post office, &c.	7,674 35			7,674 35
Three Rivers, custom house	2,914 95			2,914 95
“ drill hall	3,174 97			3,174 97
“ post office	2,733 45			2,733 45
Valleyfield, post office, &c.	25,928 36	40 35		25,968 71
Victoriaville, post office, &c.		818 97		818 97
West Farnham, post office		12 60		12 60
Quebec, generally			2,068 91	2,068 91
Heating, lighting, water, &c., for all buildings in Quebec (for detail, see page 32)			92,706 29	92,706 29
Totals, Quebec	346,549 02	28,372 88	97,692 90	472,614 80
<i>Ontario.</i>				
Alexandria, post office, &c.	10,055 86			10,055 86
Almonte, post office, &c.		43 42		43 42
Amherstburg, post office		115 94		115 94
Arnprior, post office, &c.		286 80		286 80
Barrie, post office, &c.		6 25		6 25
Belleville, post office, &c.		1,117 67		1,117 67
Berlin, post office, &c.	2,716 67	66 60		2,783 27
Bowmanville, post office, &c.	15,009 71	17 05		15,026 76
Brampton, post office, &c.		22 25		22 25
Brantford, drill hall	19,937 85			19,937 85

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construction and Improvements.	Repairs and Furniture.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>PUBLIC BUILDINGS—<i>Continued.</i></b>				
<i>Ontario—Continued.</i>				
Brantford, post office, &c. . . . .	2,948 18	19 90		2,968 08
Bridgburg, post office, &c. . . . .	8,026 72			8,026 72
Brockville, post office, &c. . . . .	4,323 96	191 37		4,515 33
“ drill hall. . . . .		15 15		15 15
Burford, drill hall . . . . .	12,460 31			12,460 31
Carleton Place, post office, &c. . . . .		3 00		3 00
Cayuga, post office, &c. . . . .		52 43		52 43
Chatham, armoury . . . . .	10,575 59			10,575 59
“ post office, &c. . . . .	2,100 40	95 80		2,196 20
Clinton, post office, &c. . . . .	1,515 16	112 75		1,627 91
Cobourg armoury. . . . .	20,014 62			20,014 62
“ post office, &c. . . . .		1,232 31		1,232 31
Collingwood, post office, &c. . . . .		222 50		222 50
Cornwall, post office, &c. . . . .		93 50		93 50
Deseronto, post office, &c. . . . .	595 00	72 71		667 71
Fort William, post office, &c. . . . .	6,070 23	22 45		6,092 68
Galt, post office, &c. . . . .		421 34		421 34
Gananoque, post office . . . . .		48 75		48 75
Goderich, post office, &c. . . . .		81 35		81 35
Guelph, armoury . . . . .	369 06			369 06
“ post office, &c. . . . .	13,969 05	3 00		13,972 05
Hamilton, drill shed . . . . .	30,148 47			30,148 47
“ examining warehouse . . . . .	1,281 13			1,281 13
“ post office, &c. . . . .		6,312 14		6,312 14
“ power for elevators . . . . .			36 00	36 00
Hawkesbury, post office, &c. . . . .	4,438 53			4,438 53
Ingersoll, post office, &c. . . . .		41 55		41 55
Kenora, post office, &c. . . . .	19 90			19 90
Kingston, custom house . . . . .		512 79		512 79
“ field battery stable . . . . .	173 76			173 76
“ military college . . . . .	8,671 42			8,671 42
“ post office . . . . .		551 16		551 16
Lindsay, post office, &c. . . . .		31 64		31 64
London, custom house . . . . .		376 84		376 84
“ drill hall and armoury. . . . .	96,048 36			96,048 36
“ military stores . . . . .	261 66			261 66
“ post office . . . . .	10,082 85	612 07		10,694 92
Napanee, post office, &c. . . . .		517 44		517 44
Niagara Falls, post office, &c. . . . .		753 07		753 07
North Bay, post office, &c. . . . .	3,060 00			3,060 00
Orangeville, post office, &c. . . . .		22 50		22 50
Orillia, post office, &c. . . . .		138 97		138 97
Oshawa, post office . . . . .	5,988 32			5,988 32
Ottawa astronomical observatory . . . . .	47,819 13			47,819 13
“ departmental buildings (Western) . . . . .	19,244 35			19,244 35
“ Dominion archives building . . . . .	12,357 65			12,357 65
“ experimental farm . . . . .	1,892 18	4,644 63		6,536 81
“ government printing bureau . . . . .	33,826 18			33,826 18
“ lovers' walk, retaining wall, &c. . . . .	10,007 30			10,007 30
“ major's hill park . . . . .			8,236 80	8,236 80
“ national art gallery . . . . .	6,231 00		540 00	6,771 00
“ new government coal shed . . . . .	203 00			203 00
“ new workshop. . . . .	45,086 93			45,086 93
“ parliament building . . . . .	28,625 14			28,625 14
“ paying in front of parliament building, &c. . . . .	9,891 18			9,891 18
“ post office . . . . .	79,998 12			79,998 12
“ Rideau Hall . . . . .	11,598 75	24,573 29		36,172 04
“ Rideau Hall, grounds, \$5,623.28; snow, \$1,449.41; fuel and light, \$8,000; watchman, \$547.50 . . . . .			15,620 19	15,620 19
“ royal mint . . . . .	49,936 43			49,936 43
“ Victoria memorial museum . . . . .	18,480 33			18,480 33

## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construction and Improvements.	Repairs and Furniture.	Staff and Maintenance.	Total.
<b>PUBLIC BUILDINGS—Continued.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
<i>Ontario—Concluded.</i>				
Ottawa, generally: parliament grounds . . . . .			11,522 88	11,522 88
“ “ power for elevators, &c. . . . .			3,649 37	3,649 37
“ “ removal of snow. . . . .			3,599 05	3,599 05
“ “ repairs and furniture . . . . .		237,887 22		237,887 22
“ “ telephone service. . . . .			14,672 29	14,672 29
Paris, post office, &c. . . . .		40 00		40 00
Pembroke, post office, &c. . . . .		1,962 65		1,962 65
Peterboro', drill shed . . . . .	10,130 80			10,130 80
“ custom house . . . . .		39 98		39 98
“ post office . . . . .	3,000 00	127 64		3,127 64
Petrolia, post office, &c. . . . .		10 70		10 70
Pictou, post office, &c. . . . .		30 61		30 61
Port Arthur, immigrant shed . . . . .		10 00		10 00
“ post office, &c. . . . .		600 10		600 10
Port Colborne, post office, &c. . . . .	1,267 75	13 56		1,281 31
Port Hope, post office, &c. . . . .		491 32		491 32
Prescott, post office . . . . .		157 78		157 78
Sandwich, post office, &c. . . . .	1,963 25			1,963 25
Sarnia, post office, &c. . . . .	1,713 08			1,713 08
Sault Ste. Marie, post office, &c. . . . .	27,519 42			27,519 42
Simcoe, post office, &c. . . . .	2,204 93			2,204 93
Smith's Falls, post office, &c. . . . .		38 36		38 36
Stratford, drill shed. . . . .	25,972 73			25,972 73
“ post office, &c. . . . .		559 54		559 54
Strathroy, post office, &c. . . . .		40 96		40 96
St. Catharines, drill hall . . . . .	63,818 60			63,818 60
“ post office, &c. . . . .		101 97		101 97
St. Thomas, post office, &c. . . . .		120 95		120 95
Toronto, asst. rec. gen. office . . . . .		889 70		889 70
“ barracks . . . . .	102 00			102 00
“ custom house . . . . .	436 35	1,394 34		1,830 69
“ drill hall . . . . .	752 27	16 80		769 07
“ examining warehouse . . . . .	34,748 87	1,350 16		36,099 03
“ post office . . . . .	10,584 66	4,873 63		15,458 29
“ post office, pneumatic tube system. . . . .	8,227 62			8,227 62
“ post office, power for elevators. . . . .		501 18		501 18
“ postal station “A” . . . . .		961 02		961 02
“ postal station “B” . . . . .		48 49		48 49
“ postal station “C” . . . . .	1,100 00	635 40		1,735 40
“ postal station “F” . . . . .	14,859 10			14,859 10
“ Junction, post office. . . . .	17,824 29			17,824 29
Trenton, post office, &c. . . . .		56 35		56 35
Walkerton, post office, &c. . . . .		261 83		261 83
Windsor, post office, &c. . . . .		164 19		164 19
Wingham, post office, &c. . . . .	8,816 92			8,816 92
Woodstock, post office, &c. . . . .		391 27		391 27
“ armoury. . . . .	23,345 93			23,345 93
Ontario, generally . . . . .			1,292 93	1,292 93
Heating, lighting, water, &c., for all buildings in Ontario (for details, see page 34) . . . . .			291,292 87	291,292 87
Totals, Ontario. . . . .	924,429 11	296,748 80	350,963 56	1,572,141 47
<i>Manitoba.</i>				
Brandon, drill shed. . . . .	3,375 07			3,375 07
“ experimental farm. . . . .	1,040 51	863 89		1,904 40
“ emigrant shed. . . . .		237 65		237 65
Brandon, post office, &c. . . . .		2,769 07		2,769 07
Dauphin, immigrant shed . . . . .		110 00		110 00
Emerson, cattle quarantine station. . . . .	975 00			975 00
“ custom house. . . . .		270 50		270 50

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS— <i>Continued.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Manitoba—Concluded.</i>				
Selkirk post office. . . . .	2 70			2 70
Stonewall, immigrant shed. . . . .		246 00		246 00
Portage la Prairie, post office. . . . .		227 44		227 44
Virden, drill shed. . . . .	4,702 10			4,702 10
Winnipeg, custom house. . . . .		2,638 78		2,638 78
“ Dominion lands office. . . . .		569 15		569 15
“ examining warehouse. . . . .		405 15		405 15
“ immigrant shed. . . . .	83,843 19	607 01		84,450 20
“ military buildings—				
“ stores. . . . .	4,128 42			4,128 42
“ magazine. . . . .	3,051 16			3,051 16
“ quarters for non-com. officers. . . . .	137 48			137 48
“ paving. . . . .	4,948 60			4,948 60
“ post office. . . . .		6,412 89		6,412 89
“ post office, power for elevators. . . . .			36 37	36 37
“ post office, new building. . . . .	187,340 37			187,340 37
Manitoba generally. . . . .			149 11	149 11
Heating, lighting, water, &c., for all build- ings in Manitoba (for details see page 34) . . . . .			24,430 98	24,430 98
Totals, Manitoba. . . . .	293,544 60	15,357 53	24,616 46	333,518 59
<i>North-west Territories.</i>				
Battleford, Dominion lands office . . . . .		571 15		571 15
Cattle quarantine, corrals at various points. . . . .	11,614 04			11,614 04
Calgary, court house, &c. . . . .		454 00		454 00
“ immigrant building. . . . .		202 52		202 52
“ post office, &c. . . . .	947 87	92 36		1,040 23
Carnduff, court house. . . . .		300 77		300 77
Craik, immigrant shed. . . . .	1,025 55			1,025 55
Davidson, immigration shed. . . . .		129 86		129 86
Duck Lake, immigrant shed. . . . .		45 00		45 00
Edmonton, court house. . . . .		35 75		35 75
“ Dom. lands and registry office. . . . .		975 72		975 72
“ immigrant shed. . . . .		21 40		21 40
“ jail. . . . .	34,999 80			34,999 80
“ post office. . . . .		43 75		43 75
Indian Head, experimental farm . . . . .		840 34	7 80	848 14
Lethbridge, court house and custom house. . . . .		112 10		112 10
“ immigration building. . . . .	957 20	26 85		984 05
“ post office. . . . .		34 20		34 20
Lloydminster, immigrant shed . . . . .	2,512 46	16 00		2,528 46
Macleod, court house . . . . .	1,572 00	779 25		2,351 25
Medicine Hat, court house. . . . .		379 08		379 08
Moose Jaw, post office. . . . .	7,732 59			7,732 59
Moosomin, court house. . . . .	517 89			517 89
Prince Albert, court house and post office . . . . .	39,516 87			39,516 87
“ Dominion lands registry office. . . . .		76 95		76 95
“ immigrant shed. . . . .		24 00		24 00
Qu'Appelle, immigrant shed. . . . .	462 45			462 45
Red Deer, court house and Dominion lands office . . . . .	7,537 14			7,537 14
Regina, court house . . . . .		491 32		491 32
“ Dominion lands and registry office . . . . .		1,748 18		1,748 18
“ immigrant building. . . . .	1,739 87			1,739 87
“ Lieut.-Governor's residence. . . . .	1,051 91	1,657 59		2,709 50
Regina, N. W. M. P. barracks. . . . .	2,930 00			2,930 00
“ post office. . . . .		1,189 93		1,189 93
Rosthern, immigrant shed. . . . .		84 00		84 00
Saltcoats, immigrant shed. . . . .		142 40		142 40

## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
<b>PUBLIC BUILDINGS—Continued.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
<i>North-west Territories—Concluded.</i>				
Saskatoon, post office.....	2,067 55			2,067 55
Stratheona, immigrant shed.....		183 25		183 25
Wolseley, court house.....		242 90		242 90
Yorkton, court house, and jail.....		701 96		701 96
Heating, lighting, water, &c., for all buildings in N.W.T. (for details see page 35).....			24,973 27	24,973 27
Totals, N. W. Territories.....	117,045 19	11,570 38	24,973 27	153,768 84
<i>British Columbia.</i>				
Agassiz, experimental farm.....	900 36	58 43		958 79
Atlin, post office, &c.....		53 70		53 70
Fernie, post office.....	190 05			190 05
Gateway, cattle quarantine station.....	731 25			731 25
Huntingdon, custom house.....		407 21		407 21
Kamloops, post office, &c.....		585 65		585 65
Midway, cattle quarantine station.....	583 75			583 75
Nanaimo, post office, &c.....	12,073 68	167 25		12,240 93
Nelson, cattle quarantine station.....	1,058 20			1,058 20
" post office, &c.....		401 98		401 98
New Westminster, post office.....		204 41		204 41
Rossland, post office, &c.....	1,767 87			1,767 87
" armoury.....	21,212 03			21,212 03
Vancouver, custom house.....		864 14		864 14
" examining warehouse.....		26 75		26 75
" post office.....	2,608 86			2,608 86
" post office (new building).....	1,822 04			1,822 04
Victoria, old custom house.....		3,178 58		3,178 58
" drill hall.....	368 50			368 50
" marine hospital.....		5 00		5 00
" post office.....	947 70	1,560 28		2,507 98
" post office (power for elevators).....			218 12	218 12
" old post office.....		189 74		189 74
Williams' Head, quarantine station.....	19,500 00		387 50	19,887 50
British Columbia, generally.....			159 57	159 57
Heating, lighting, water, &c., for all build- ings in British Columbia, (for details see page 36).....			26,767 90	26,767 90
Totals, British Columbia.....	61,155 43	10,311 98	27,533 09	99,000 50
<i>Yukon Territory.</i>				
White Horse, post office, &c.....	5,368 37	697 21		6,065 58
Heating, lighting, water, &c., for all buildings in Yukon Territory, (for details see page 36).....			91,063 08	91,063 08
Totals, Yukon Territory.....	5,368 37	697 21	91,063 08	97,128 66
<i>Public Buildings Generally.</i>				
Salaries of clerks of works and assistants.....			12,177 36	12,177 36
Printing, stationery, instruments, travel- ling, &c.,.....			11,169 46	11,169 46
Totals, public buildings generally.....			23,346 82	23,346 82



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Nova Scotia.</i>					
Abram's River .....		118 73			118 73
Advocate Harbour .....		1,724 22			1,724 22
Apple River wharf .....		19 81			19 81
Bailey Brook wharf .....		1,471 46			1,471 46
Barachois .....		1,499 80			1,499 80
Barrington Passage .....	483 72	1,999 90			2,483 62
Bass River wharf .....			1,200 03		1,200 03
Battery Point wharf .....		2,062 21			2,062 21
Bayfield .....			4,147 06		4,147 06
Bear Cove .....		77 67			77 67
Beckerton .....		2,192 03			2,192 03
Belliveau Cove .....			576 91		576 91
Big Harbour (Port Bevis) .....		3,989 38			3,989 38
Big Pond .....		7,900 00			7,900 00
Boularderie Centre .....		349 87			349 87
Breton Cove .....		6,003 04			6,003 04
Broad Cove Marsh .....			999 85		999 85
Cape Sable Island, east end .....		2,606 17			2,606 17
Caribou Island .....		1,224 44			1,224 44
Cheggogin pier .....		1,498 58			1,498 58
Cheticamp (Eastern Harbour) .....	2,395 64				2,395 64
Cheticamp Point-wharf .....		13,093 96			13,093 96
Cheverie breakwater .....			800 02		800 02
Church Point .....			2,100 00		2,100 00
Clam Harbour .....			287 10		287 10
Clark's Harbour .....		2,993 40			2,993 40
Country Harbour .....		140 66			140 66
Cow Bay (Port Morien) .....			12,695 09		12,695 09
Cow Bay Run breakwater .....		2,000 00			2,000 00
Cribbin's Point .....			2,127 22		2,127 22
Cunningham's Point .....		103 58			103 58
D'Escousse wharf .....			899 78		899 78
Devils Island .....		4,144 28			4,144 28
Digby pier .....			1,440 60		1,440 60
East Chezzetcook .....		4,093 24			4,093 24
East Jeddore wharf .....		928 07			928 07
Eatonville .....			174 26		174 26
Economy wharf .....		1,000 00			1,000 00
Finlay's Point wharf .....		984 51			984 51
Forbes Point .....			241 80		241 80
Fort Lawrence, landing pier .....		12,798 50			12,798 50
Freeport .....		5,034 92			5,034 92
French Village .....		2,037 67			2,037 67
Fruids Point wharf .....		59 40			59 40
Gabarus .....		2,032 44			2,032 44
Georgeville wharf .....		1,999 62			1,999 62
Grand Etang harbour .....		52 75			52 75
Grand Narrows wharf .....			1,435 49		1,435 49
Grand River .....		485 35			485 35
Granite Village .....		782 64			782 64
Green Cove .....		492 50			492 50
Grosses Coques .....			917 70		1,917 70
Gull Island .....		1,580 96			1,580 96
Halifax graving dock .....				10,000 00	10,000 00
Habitant River (Canning) .....		944 82			944 82
Hall's Harbour .....		1,140 52			1,140 52
Hampfort .....		1,198 06			1,198 06
Hantsport .....			400 00		400 00
Harrington's Cove .....		1,208 02	39 84		1,247 86
Iona wharf .....		12,078 92			12,078 92
Indian Harbour .....		1,160 50			1,160 50
Irish Cove .....			1,000 04		1,000 04
Island Point, wharf .....			568 92		568 92



## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS					
—Con.					
Nova Scotia—Con.					
Janvrin's Island. . . . .		1,974 82			1,974 82
Kingsport. . . . .		163 01			163 01
L'Ardoise, breakwater. . . . .		18,583 00			18,583 00
Larry's River, breakwater. . . . .		3,382 52			3,382 52
Lingan, beach protection. . . . .		999 98			999 98
Litchfield. . . . .		3,000 00			3,000 00
Little Brook. . . . .			2,000 13		2,000 13
Little Harbour (or Arnold Pt.). . . . .		401 05			401 05
Little Judique. . . . .		985 63			985 63
Liverpool. . . . .	562 12		50 00		612 12
Livingston's Cove. . . . .			2,211 30		2,211 30
Lockeport. . . . .	959 63		924 73		1,884 36
Long Point. . . . .		1,830 96			1,830 96
McKay's Point, wharf. . . . .		5,637 30			5,637 30
McNair's Cove. . . . .		5,221 09			5,221 09
Mabou Bridge wharf. . . . .		998 18			998 18
Mabou Harbour. . . . .	7,269 82				7,269 82
Malagawatch. . . . .		300 00			300 00
Malagash. . . . .		10 41			10 41
Main a Dieu, breakwater. . . . .		296 49			296 49
Malignant Cove. . . . .		2,813 95			2,813 95
Margaree Harbour. . . . .		1,247 96			1,247 96
Margaree Island. . . . .		47 91			47 91
Margaretville. . . . .			2,586 06		2,586 06
Melborne wharf. . . . .		25 38			25 38
Meteghan (Cove). . . . .		2,000 00			2,000 00
Meteghan River. . . . .			333 16		333 16
Middle East Pubnico. . . . .		3,531 67			3,531 67
Middle River. . . . .		999 87			999 87
Mill Cove. . . . .		27 47			27 47
Monk's Head. . . . .			179 78		179 78
Morden. . . . .			49 99		49 99
Musquodoboit. . . . .		74 26			74 26
Neil's Harbour, breakwater. . . . .		952 79			952 79
New Campbellton (Kelly's Cove). . . . .		182 46			182 46
Newellton. . . . .			836 56		836 56
Newport Landing. . . . .		1,685 74			1,685 74
Noel. . . . .			1,006 54		1,006 54
North Gut, St. Anns (Morri- son's Point). . . . .		1,991 38			1,991 38
North River, St. Anns. . . . .			331 40		313 40
North Sydney. . . . .	7,479 23				7,479 23
Ogden's Pond. . . . .		499 86			499 86
Ogilvie. . . . .		1,870 30			1,870 30
Oyster Pond. . . . .		449 69			449 69
Parrsboro'. . . . .		3,180 15			3,180 15
Pembroke, breakwater. . . . .		4,193 55			4,193 55
Petit de Grat. . . . .		928 64			928 64
Pickett's Pier. . . . .		2,104 62			2,104 62
Pictou Light Beach. . . . .		598 83			598 83
Pictou Bar. . . . .	1,875 32				1,875 32
Pictou Market Wharf. . . . .	1,598 13				1,598 13
Pleasant Bay. . . . .		104 65			104 65
Plvnmpton. . . . .			1,030 58		1,030 58
Porter's Lake. . . . .		4,347 29	92 78		4,440 07
Port au Pique. . . . .		1,884 23			1,884 23
Port Dufferin. . . . .			461 16		461 16
Port George breakwater. . . . .		199 50			199 50
Port Greville. . . . .			6,649 08		6,649 08
Port Hawkesbury. . . . .		12,517 54			12,517 54
Port Hood. . . . .		19,942 43	1,799 86		21,742 29

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b>					
<i>—Con.</i>					
<i>Nova Scotia—Con.</i>					
Port La Tour, breakwater. . . . .		2,675 96			2,675 96
Port Lorne . . . . .			999 93		999 93
Port Maitland . . . . .		1,465 72			1,465 72
Port Mouton . . . . .			106 27		106 27
Sandy Cove, breakwater . . . . .		2,927 48			2,927 48
Saulnierville . . . . .			1,999 29		1,999 29
Scott's Bay . . . . .		998 84			998 84
Seaside . . . . .			177 00		177 00
Sherrow's Channel . . . . .	7,805 22				7,805 22
Shelburne . . . . .	3,899 38				3,899 38
Short Beach . . . . .		1 85			1 85
Skinner's Cove . . . . .		3,225 14			3,225 14
Spry Bay wharf . . . . .		1,500 00			1,500 00
Summerville . . . . .		1,532 76			1,532 76
Swim's Point wharf . . . . .		307 30			307 30
Sydney quarantine station . . . . .		1,673 71			1,673 71
Tenecape breakwater . . . . .		6,800 00			6,800 00
Three Fathom Harbour . . . . .		40 33			40 33
Trout Cove . . . . .		389 85			389 85
Victoria Beach . . . . .		60,640 23	182 39		60,822 62
Wallace . . . . .			3,980 26		3,980 26
Wedge Point . . . . .		2,367 47			2,367 47
West Arichat . . . . .		848 40	499 97		1,348 37
West Bay, Richmond (south side). . . . .		1,335 00			1,335 00
West Berlin . . . . .		1,304 66			1,304 66
West Chezzetcook . . . . .			2,931 79		2,931 79
White Head . . . . .		980 23			980 23
White's Cove . . . . .		1,004 01			1,004 01
Whitewater . . . . .			404 24		404 24
Windsor Harbour . . . . .		53 07			53 07
Whycomagh . . . . .		499 98			499 98
Wolfville . . . . .			2,643 91		2,643 91
Yarmouth Harbour . . . . .	325 98				325 98
Yarmouth Bar . . . . .			948 32		948 32
Generally, N.S. . . . .				2,977 47	2,977 47
Totals, Nova Scotia . . . . .	34,654 19	314,335 15	68,450 19	12,977 47	430,417 00
<i>Prince Edward Island.</i>					
Bay Fortune breakwater . . . . .			449 04		449 04
Bay View . . . . .		673 79			673 79
Beach Point . . . . .		471 27			471 27
Belfast . . . . .		1,749 40			1,749 40
Campbell's Cove . . . . .			471 09		471 09
Canoe Cove . . . . .		988 18			988 18
Casumpec harbour . . . . .			29 60		29 60
China Point . . . . .		294 77			294 77
Cove Head harbour . . . . .			100 00		100 00
Georgetown . . . . .	1,328 80				1,328 80
Grahams Pond . . . . .			499 90		499 90
McPherson's Cove . . . . .		2,645 58			2,645 58
Miminigash . . . . .		1,438 54			1,438 54
Mink River Pier . . . . .			300 61		300 61
Montague River . . . . .	3,283 98				3,283 98
Morell . . . . .	3,107 59				3,107 59
New London . . . . .		5,461 25	749 00		6,210 25
North Cardigan Pier . . . . .		279 46			279 46
Panmure Island . . . . .		1,285 92			1,285 92
Point Prim wharf . . . . .		29 32			29 32

## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b> —Con.					
<i>Prince Edward Island—Con.</i>					
Port Selkirk .....			698 70		698 70
Richmond Bay, Grand River Ferry .....		1,506 72			1,506 72
Rustico Harbour, Robinson's Island breakwater .....		1,457 27			1,457 27
Rustico Harbour, north b'water .....	738 47		191 95		930 42
St. Peter's Bay breakwater .....		193 74			193 74
Savage Harbour .....		1,006 00			1,006 00
Souris, Knight's Point .....		4,598 37			4,598 37
Summerside harbour .....		160 00			160 00
Tignish, southern breakwater .....		42 09			42 09
West Point .....			491 55		491 55
Wood Islands .....	9,403 45	249 93			9,653 38
Harbours generally (P.E.I.) .....			1,710 00	1,367 93	3,077 93
<b>Totals, P.E. Island.</b> .....	<b>17,862 29</b>	<b>24,531 60</b>	<b>5,691 44</b>	<b>1,367 93</b>	<b>49,453 26</b>
<i>New Brunswick.</i>					
Anderson's Hollow .....			1,597 90		1,597 90
Bathurst .....			25 00		25 00
Belliveau, wharf .....			298 93		298 93
Black Brook (Loggieville) .....		3,500 24			3,500 24
Black River wharf .....			303 79		303 79
Buctouche wharf .....			1,885 17		1,885 17
Buctouche channel .....		2,027 17			2,027 17
Burnt Church .....			600 02		600 02
Cambellton, ferry wharf .....		573 93			573 93
Campbellton, wharf extension and repairs .....	620 96	41,732 90			42,353 86
Campobello (Wilson's Beach) .....		1,800 00			1,800 00
Cape Tormentine .....		19,998 34			19,998 34
Caraquet .....		31,539 00			31,539 00
Chance Harbour .....		2,875 54			2,875 54
Chatham .....	1,957 50				1,957 50
Chockfish, extension of training pier .....		1,189 50			1,189 50
Clifton (Stonehaven) .....			2,499 23		2,499 23
Dalhousie, harbour improven't .....		30 42			30 42
Dipper Harbour .....		4,639 65			4,639 65
Durham .....		146 85			146 85
Edgett's Landing .....			3,000 00		3,000 00
Fox Creek .....			999 80		999 80
Grand Lake, Maquapit and French Lake .....	1,999 31				1,999 31
Great Salmon River break- water, &c. .....		183 63			183 63
Hopewell Cape .....			1,999 92		1,999 92
Hopewell Hill .....		691 09			691 09
L'Étang Harbour .....			252 45		252 45
Little Salmon River .....		511 96			511 96
Lord's Cove, Deer Island .....		212 38			212 38
Mace's Bay .....		349 20			349 20
Miramichi River (N.W. branch) .....	4,740 00				4,740 00
Miscou Harbour, wharf .....		3,490 30			3,490 30
Mud Cove .....		491 57			491 57
Neguae .....	275 00				275 00
North Head Grand Manan breakwater wharf .....		164 09			164 09
Partridge Island .....	2,227 59		900 39		3,127 98
Petit Rocher, breakwater .....		7,195 91			7,195 91

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b>					
<i>—Con.</i>					
<i>New Brunswick—Con.</i>					
Point du Chene . . . . .	5,874 71		3,998 06		9,872 77
Point Wolfe . . . . .			497 35		497 35
Quaco . . . . .		1,844 11			1,844 11
Richibucto . . . . .		1,002 42			1,002 42
River St. John and tributaries—					
Grand Falls . . . . .	573 84				
Green River . . . . .	50 00				
Iroquois River . . . . .	225 03				
Quisibus River . . . . .	183 75				
St. Francis River . . . . .	200 00				
Salmon River . . . . .	150 00				
Tobique River . . . . .	2,273 12				
Trout River . . . . .	150 00				
Touladié River . . . . .	200 00				
Upper St. John (St. Hilaire) . . . . .	193 50				
Generally . . . . .	909 34				
		5,108 58			5,108 58
River Upsalquiteb. . . . .		470 54			470 54
St. John Harbour (Negro Point breakwater) . . . . .		19,994 91			19,994 91
St. John Harbour—dredging . . . . .	20,156 01				20,156 01
St. John Harbour, protection works at base Fort Dufferin . . . . .			974 95		974 95
Shippegan Harbour . . . . .	10,075 47	7,755 42			17,830 89
Shippegan (wharf at Laneque) . . . . .		3,999 80			3,999 80
Shippegan (wharf at terminus of Caraquet Ry) . . . . .		26 83			26 83
Traverse (Restigouche Co.) . . . . .	1,564 70				1,564 70
Tynemouth Creek . . . . .		499 80			499 80
Upper Salmon River (Alma Pier) . . . . .		1,766 50			1,766 50
Washedemoak Lake . . . . .	3,467 95				3,467 95
Westfield . . . . .	362 19				362 19
Generally, N.B. . . . .				2,977 48	2,977 48
Totals, New Brunswick . . . . .	53,321 39	165,812 58	19,832 96	2,977 48	241,944 41
<i>Quebec.</i>					
Anse à Beaufils . . . . .		1,548 48			1,548 48
Anse aux Gascons . . . . .		11,612 50			11,612 50
Anse aux Griffons . . . . .		1,608 26			1,608 26
Anse du Cap . . . . .		2,111 04			2,111 04
Anse St. Jean . . . . .		1,191 99			1,191 99
Baie des Peres (Ville Marie) . . . . .		521 76			521 76
Baie St. Paul, repairs to wharf at Cap aux Corbeaux . . . . .			1,789 77		1,789 77
Barachois de Malbaie . . . . .		4,264 41			4,264 41
Beauharnois . . . . .	2,670 00				2,670 00
Belœil, guide piers . . . . .	134 00		676 68		810 68
Berthier (en bas) . . . . .			791 04		791 04
Bie, pier at Pointe à Côté . . . . .		5,044 59			5,044 59
Bois Brûlé, training pier . . . . .		1,161 02			1,161 02
Bonaventure, East . . . . .		12,722 50			12,722 50
Bromptonville . . . . .		1,970 59			1,970 59
Calumet (Co. Argenteuil) . . . . .	4,502 35				4,502 35
Cacouna . . . . .		1,249 29			1,249 29

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construc- tion and Improvements.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS —Con.					
Quebec—Con. 1 "					
Canton Fabre, Lake Temiskaming.		1,329 03			1,329 03
Caplan.		11,510 40			11,510 40
Cap Rouge (Gaspé).			251 90		251 90
Cap Santé.			2,498 89		2,498 89
Chambord.		8,066 67			8,066 67
Champlain.		8,163 62			8,163 62
Charlemagne.	3,104 00				3,104 00
Chateau Richer.		7,160 86			7,160 86
Como.	952 00				952 00
Coteau du Lac.			710 75		710 75
Chicoutimi wharf.			190 42	175 22	365 64
Corner-of-the-Beach (Gaspé)			323 53		323 53
Coteau Landing.		9,001 48			9,001 48
Crane Island, south side.			3,181 73		3,181 73
Cross Point.			99 95		99 95
Deschambault.		9,828 76			9,828 76
Desjardins, Alouette Island.		10,957 42			10,957 42
D'Israeli Landing.		4,990 62			4,990 62
Doucet's Landing.	20,034 42				20,034 42
Douglstown.		10,349 86			10,349 86
East Templeton.			1 77		1 77
English River.		4,823 55			4,823 55
Escoumains.		8,420 00			8,420 00
Father Point, landing pier.		22,115 58			22,115 58
Gatineau Point.			2,171 04		2,171 04
Georgeville.			1,016 70		1,016 70
Graham.	2,391 10				2,391 10
Grandes Bergeronnes.		1,762 58			1,762 58
Grande Vallée.		15,098 90			15,098 90
Grands Mechins.		3,597 36			3,597 36
Grand Pabos.			73 80		73 80
Gronclines.		7,500 57			7,500 57
Grenville.	3,856 60				3,856 60
Grosse Isle, quarantine wharf.		1,211 48			1,211 48
Hull wharf.			15 56	167 50	183 06
Isle aux Nois (Barbotte River).	857 76				857 76
Isle Bizard and St. Genevieve, piers and spans.			5,113 40		5,113 40
Isle aux Coudres.			1,937 27		1,937 27
Isle Perrot.			40 41		40 41
Isle Verte.			800 00		800 00
Kamouraska.		1,499 02			1,499 02
Knowltons Landing.			60 99		60 99
Lac Labelle, piers.		1,225 27			1,225 27
Lake Megantic, pier.			1,149 03		1,149 03
Lake St. John, wharfs generally.				2,535 75	2,535 75
Lake Nominigue.		2,137 20			2,137 20
Lanoraie.			674 20		674 20
L'Anse à Giles.		987 94			987 94
L'Anse à l'Ilot.			397 20		397 20
Laprairie, ice piers, &c.		25,494 07			25,494 07
Lavaltrie.		24 35			24 35
Les Eboulements.		25 40			25 40
Les Ecureuils.		3,396 22			3,396 22
Levis, graving dock.				13,301 54	13,301 54
Le Tableau, Descente des Fem- mes, wharf on River Saguenay		987 24			987 24
L'Isle d'Alma, removal of rocks		995 85			995 85

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS					
— <i>Con.</i>					
Quebec— <i>Con.</i>					
Little Pabos.....		1,326 78			1,326 78
Lotbiniere.....		10,719 99			10,719 99
Lower St. Lawrence—...					
Anse Aspirot.....			100 00		100 00
Bon Desir.....			189 50		189 50
Breche à Menon.....			25 00		25 00
Cap Chatte.....			90 00		90 00
Cape Cove.....			197 50		197 50
Cap D'Espoir.....			25 00		25 00
Cap Rouge.....			28 15		28 15
Chlorydorme.....			10 75		10 75
Escoumains.....			300 46		300 46
Grand River.....			150 00		150 00
Grand Pabos.....			100 00		100 00
Grand Tourelle.....			51 00		51 00
Hopetown Beach.....			100 00		100 00
Jersey Cove.....			297 60		297 60
Little Pabos.....			25 00		25 00
Little River.....			273 25		273 25
Petite Bergeronne.....			824 37		824 37
Petite Tourelle.....			50 00		50 00
Petite Vallée.....			50 00		50 00
Port Daniel.....			99 83		99 83
Riviere Ste. Anne.....			36 00		36 00
Riviere St. Godefroi.....			100 00		100 00
St. Georges de Malbaie.....			26 75		26 75
Magdalen Islands, breakwaters					
Anse au Moulin.....		23 63			23 63
Bassin.....		3,890 98			3,890 98
Grindstone.....		9,298 69			9,298 69
Pointe à Elie.....		6,389 89			6,389 89
Generally.....				394 99	394 99
Magog.....			3,241 13		3,241 13
Maguasha.....		3,695 00			3,695 00
Maria Pier.....			502 50		502 50
Masson.....		5,063 60			5,063 60
Matane.....			1,878 36		1,878 36
Mille Vaches.....		1,003 14			1,003 14
Mistook (Delisle) wharf.....		5,001 05			5,001 05
Mont Louis.....		3,003 25			3,003 25
Montmagny wharf.....		32 96			32 96
Montmorency Falls.....		6,278 82	230 00		6,508 82
Montreal Harbour.....		74,442 69			74,442 69
Murray Bay.....	883 99	3,081 29			3,965 28
New Carlisle.....		4,066 89			4,066 89
Newport breakwater.....		4,450 96	31 01		4,481 97
New Richmond breakwater.....		13,245 37			13,245 37
Nicolet, jetty.....			8,830 53		8,830 53
Nicolet River, dredging.....	1,490 00				1,490 00
Notre Dame du Portage.....		8,043 70			8,043 70
Paspebiac, landing pier.....		16,641 24			16,641 24
Pentecoste.....	5,565 12		100 00		5,665 12
Peel Head, Missisquoi Bay.....		1,758 34			1,758 34
Percé wharf (North Cove).....		1,080 50			1,080 50
Percé, South Beach.....		988 45			988 45
Petites Bergeronnes.....			898 58		898 58
Petite Riviere Peribonka.....			627 76		627 76
Pierreville.....		8,369 61			8,369 61
Pointe aux Esquimaux.....		1,726 78			1,726 78

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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS —Con.					
Quebec—Con.					
Pointe aux Trembles (Port- neuf Co.)		9,958 17			9,958 17
Pointe à Valois			204 78		204 78
Pointe St. Pierre, breakwater		380 00			380 00
Port Daniel		11,013 88			11,013 88
Portneuf		1,000 00			1,000 00
Quebec Harbour, improvem'ts.	3,480 16	149,990 67			153,470 83
Rigaud	15,928 28				15,928 28
Repentigny wharf		6,498 95			6,498 95
Rimouski wharf		26,576 49			26,576 49
Riviere à la Pipe wharf		961 80			961 80
River aux Renards		19,990 15			19,990 15
River Châteauguay	5,295 00				5,295 00
River des Vases, wharf		790 18			790 18
River Ottawa (Blanche shoals)	4,134 00				4,134 00
Riviere du Lievre Lock		24,144 55	726 72	4,363 65	29,234 92
Riviere du Loup (Fraserville)		9,191 00	4,204 42		13,395 42
Riviere du Loup (en haut)	9,862 04				9,862 04
Riviere Jesus	4,185 87				4,185 87
Riviere L'Assomption	10,408 24				10,408 24
Riviere Maskinongé	9,717 09				9,717 09
Riviere Ouelle	2,256 51		2,981 68		5,238 19
Riviere Saguenay	31,094 78		30 00		31,124 78
Riviere St. Louis	6,268 28			139 00	6,407 28
Riviere St. Maurice, Clute Monte-à-Peine			999 99		999 99
Riviere St. Maurice Channel, between Grandes Piles and La Tuque	7,953 02				7,953 02
do dam at Grandes Piles		4,850 57			4,850 57
Riviere St. Maurice, mouth	17,293 90				17,293 90
Riviere Touladié		2,500 00			2,500 00
Riviere Verte, wharf		5,499 61			5,499 61
Roberval	3,065 83				3,065 83
Ruisseau Leblanc			300 00		300 00
Sacré-Cœur		8,538 82			8,538 82
St. Aimé (Co. Richelieu)	473 00				473 00
St. Alexis, Baie des Ha Ha		5,627 23			5,627 23
St. Alphonse de Bagotville		1,585 86	326 56		1,912 42
St. André de Kamouraska			2,460 46		2,460 46
St. Andrews (Co. Argenteuil)	5,982 75				5,982 75
Ste. Anne des Monts		1,820 67			1,820 67
Ste. Anne de la Pocatière		4,582 42			4,582 42
Ste. Anne de la Pérade			1,997 77		1,997 77
Ste. Anne de Sorel		8,881 04			8,881 04
Ste. Anne du Saguenay, wharf		2,387 87			2,387 87
St. Antoine (Co. Vercheres)	419 88				419 88
St. Blaise		2,610 01			2,610 01
St. Charles Borromée		996 95			996 95
St. Denis (Co. St Hyacinthe)	525 00				525 00
Ste. Emélie			537 09		537 09
Ste. Famille, I.O.		15,111 88			15,111 88
St. Félicien (Lake St. John)	306 57		640 49		947 06
Ste. Fidele wharf		3,162 03			3,162 03
St. Francois de Sales		6,947 90			6,947 90
St. Francois, I.O.		184 21			184 21
St. Fulgence		4,993 37			4,993 37
St. Gédéon Islands wharf		7,525 62			7,525 62
St. Godefroi de Nouvelle		18,508 46			18,508 46



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b>					
—Con.					
<i>Quebec—Con.</i>					
St. Ignace de Loyola . . . . .		1,797 39			1,797 39
St. Irénée, wharf . . . . .		907 97			907 97
St. Jean, I.O. . . . .			956 79		956 79
St. Jean des Chaillons wharf . . . . .	3,427 25	893 20			4,320 45
St. Jean Port Joli . . . . .			5,999 59		5,999 59
St. Jérôme (Lake St. John) wharf . . . . .		727 73			727 73
St. Laurent, I.O. . . . .			574 87	317 05	891 92
St. Mathias wharf . . . . .			480 31		480 31
St. Michel de Bellechasse . . . . .	6,988 58		1,548 66		8,537 24
St. Ours . . . . .	134 00				134 00
St. Siméon . . . . .		3,088 59			3,088 59
St. Roch des Aulnaies . . . . .		2,499 99			2,499 99
Seven Island wharf . . . . .		49,881 92			49,881 92
Shegawake . . . . .		1,781 46			1,781 46
Sorel, deep water wharf . . . . .		435 30			435 30
Sorel, ice piers . . . . .		6,016 89			6,016 89
Terrebonne . . . . .	2,103 46	6,946 44			9,049 90
Three Rivers harbour . . . . .		39,201 35			39,201 35
Trois Laes or Flints Landing . . . . .			118 12		118 12
Trois Pistoles breakwater . . . . .		3,742 32			3,742 32
Vercheres . . . . .		3,010 69			3,010 69
Ville Marie (Lake Temiscaming) . . . . .	868 19				868 19
Yamaska lock and dam . . . . .			1,730 58	949 72	2,680 30
Yamaska River . . . . .	12,874 68				12,874 68
Generally . . . . .	46,937 14			18,517 09	65,454 23
Totals, Quebec . . . . .	258,424 84	913,211 68	66,095 95	40,861 51	1,278,593 98
<i>Ontario.</i>					
Amherstburg—dredging . . . . .	4,271 22				4,271 22
Barrie . . . . .		2,600 00			2,600 00
Barrys Bay (Madawaska River) . . . . .		4,770 74			4,770 74
Bayfield . . . . .	2,828 83		322 30		3,151 13
Baysville . . . . .		1,219 33			1,219 33
Beaverton . . . . .		2,975 46			2,975 46
Belle River . . . . .			2,413 28		2,413 28
Blanche River (Lake Temiscaming) . . . . .		181 30			181 30
Blind River, wharf . . . . .	9,212 00	1,991 71			11,203 71
Bowmanville . . . . .			2,600 00		2,600 00
Bracebridge wharf . . . . .		6,960 91			6,960 91
Bronte . . . . .		3,532 81			3,532 81
Burk's Falls . . . . .			287 00		287 00
Burlington Channel & bridge . . . . .		17,462 50	9,863 57	3,679 21	31,005 28
Burleigh . . . . .		1,445 41			1,445 41
Cape Croker . . . . .		2,340 70			2,340 70
Cobourg . . . . .	122 50		3,000 00		3,122 50
Colborne (Lakeport) . . . . .			2,499 51		2,499 51
Collingwood . . . . .	97,214 05				97,214 05
Cornwall . . . . .			88 07		88 07
Cumberland . . . . .	320 00	6,978 50			7,298 50
Depot Harbour . . . . .		99,110 34			99,110 34
Echo Bay . . . . .		5,015 25			5,015 25
Fort William (Kaministiquia River) . . . . .	147,134 45			1,375 00	148,509 45
Gananoque . . . . .	4,442 05				4,442 05
Georgian Bay, Pte. au Baril route . . . . .		3,729 54			3,729 54
Goderich . . . . .	2,502 66	32,644 66			35,147 32



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS					
—Con.					
Ontario—Con.					
Gore's Landing.		999 88			999 88
Grand Bend, breakwater.		11,378 00			11,378 00
Grand River (Dunnville).	17,376 00				17,376 00
Haileybury (Lake Temiscam'g)		6,008 74			6,008 74
Hamilton.	3,036 95				3,036 95
Hawkesbury.	7,799 04				7,799 04
Hilton, St. Joseph Island.			597 26		597 26
Honora.		8,074 00			8,074 00
Holland River.			512 48		512 48
Huntsville.		489 90			489 90
Indian River.	1,269 31				1,269 31
Kingston.	2,631 46				2,631 46
Kingston graving dock.				5,583 39	5,583 39
Kincardine.	2,040 00		999 70		3,039 70
Lakes Simcoe and Couchiching (Narrows)		25 50			25 50
Leamington.			4,134 43		4,134 43
Lion's Head.			521 00		521 00
Little Beaver Creek.	392 00				392 00
Little Current.	38,124 50				38,124 50
Mallorytown.		999 04			999 04
L'Original.			43 78		43 78
Matchedash Bay.		777 85			777 85
Meaford.		17,408 72	3,097 09		20,505 81
Midland.	21,621 27	15,250 00	1,228 10		38,099 37
Mitchell's Bay.	800 00				800 00
McCracken's Landing.			781 87		781 87
Newcastle.			7,000 00		7,000 00
New Liskeard (Lake Temiscam-ing)	2,712 02				2,712 02
Oakville.			781 48		781 48
Olipphant.		976 17			976 17
Oshawa.			700 00		700 00
Owen Sound.	25,730 53	7,860 55			33,591 08
Parry Sound.		227 70			227 70
Pembroke.		43,105 50			43,105 50
Petewawa wharf.		5,995 87			5,995 87
Penetanguishene.	11,544 42		1,199 10		12,743 52
Pike Creek.		3,149 43			3,149 43
Point Edward (Sarnia).	24,201 29				24,201 29
Port Arthur.	39,215 66		4,988 36		44,204 02
Port Bruce.		975 54			975 54
Port Burwell.	18,719 45	11,857 29			30,576 74
Port Colborne.		121,187 28			121,187 28
Port Dover.		9,190 50			9,190 50
Port Elgin.	1,994 00				1,994 00
Port Hope.	477 03		3,999 99		4,477 02
Port Perry.	1,364 46				1,364 46
Port Rowan.			9 13		9 13
Port Stanley.	8,609 20	9,657 93			18,267 13
Prescott.	1,946 00				1,946 00
Richard's Landing.			99 91		99 91
River St. Lawrence (dredging at Wolf Island).	1,035 36				1,035 36
Riviere aux Puces.			215 00		215 00
River Otonabee.	7,269 23				7,269 23
River Ottawa, near Hawkesbury.	864 03				864 03
Robbins Landing.			50 00		50 00
Rondeau Harbour.	5,134 59	9,582 16			14,716 75
Sarnia.	1,200 00				1,200 00

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b>					
<i>—Con.</i>					
<i>Ontario—Con.</i>					
Saugeen River . . . . .		6,407 18			6,407 18
Sault Ste. Marie . . . . .		54,710 45			54,710 45
Sault Ste. Marie, compensation to W. H. Plummer, &c . . . . .		7,000 00			7,000 00
Southampton . . . . .		599 85			599 85
Severn River . . . . .		5,379 17			5,379 17
Shrewsbury (Rondeau) . . . . .		3,058 79			3,058 79
St. Joseph (Co. Huron) . . . . .		275 00			275 00
Stokes Bay Wharf . . . . .		7,478 61			7,478 61
Sydenham River . . . . .	929 80		1,996 40		2,926 20
Tenby Bay (St. Joseph Isld.) . . . . .		711 68			711 68
Thessalon . . . . .		18,026 87			18,026 87
Thora Island (Lake Simcoe) . . . . .		394 42			394 42
Thornbury . . . . .			1,500 08		1,500 08
Toronto Harbour, eastern en- trance . . . . .		28,133 45			28,133 45
Toronto Harbour, extension of breakwater . . . . .		1,697 58			1,697 58
Treadwell . . . . .		5,074 76			5,074 76
Trenton Harbour . . . . .	5,304 33				5,304 33
Trent River, near Trenton . . . . .	3,532 50				3,532 50
Washego . . . . .			9 00		9 00
Wendover . . . . .			119 62		119 62
Whitby . . . . .	13,992 67				13,992 67
Warton . . . . .		0 87			0 87
Generally . . . . .	6,547 76			8,437 37	14,985 13
Totals, Ontario . . . . .	546,240 47	616,307 54	55,657 51	19,074 97	1,237,280 49
<i>Manitoba.</i>					
Arnes . . . . .		5,463 22			5,463 22
Gimli . . . . .			5,142 38		5,142 38
Delta . . . . .	953 97				953 97
Lake Dauphin, lowering . . . . .		814 29			814 29
Lake Frances (outlet) . . . . .	6,258 45	3,735 93			9,994 38
Lake Manitoba (outlets) . . . . .	2,378 26				2,378 26
Mossy River (mouth) . . . . .	4,514 82				4,514 82
Red River (mouth) . . . . .	16,501 64				16,501 64
Selkirk . . . . .	1,108 04	7,768 40			8,876 44
St. Andrew's Rapids (Red River) . . . . .		4,014 33			4,014 33
Generally . . . . .				2,977 12	2,977 12
Totals, Manitoba . . . . .	31,715 18	21,796 17	5,142 38	2,977 12	61,630 85
<i>North-west Territories.</i>					
Lesser Slave River . . . . .		572 55			572 55
Saskatchewan River (near Pr. Albert) . . . . .		944 51			944 51
Totals, N. W. Territories . . . . .		1,517 06			1,517 06
<i>British Columbia.</i>					
Anderson Lake . . . . .		1,231 53			1,231 53
Chilliwack . . . . .		1,999 63			1,999 63
Columbia River at Arrowhead . . . . .		5,441 77			5,441 77
Columbia River at Revelstoke . . . . .		9,267 83			9,267 83

## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS</b>					
<i>Con.</i>					
<i>British Columbia—Con.</i>					
Columbia River above Revelstoke .....		2,999 00			2,999 00
Columbia River above Golden ..		4,382 85			4,382 85
Columbia River below Golden ..		4,584 21			4,584 21
Columbia River between Upper and Lower Arrow Lakes .....	7,983 18		1,502 31		9,485 49
Coquitlam River .....		2,391 72			2,391 72
Duncan River .....		1,957 32			1,957 32
Esquimalt, graving dock .....				12,936 50	12,936 50
Fraser River .....	34,973 97	24,990 42			59,964 39
Ladysmith .....		3,976 98			3,976 98
Langley .....		1,988 77			1,988 77
Kennedy Lake .....		1,256 50			1,256 50
Kootenay River .....		1,459 17			1,459 17
Mount Lehman wharf .....		1,976 85			1,976 85
North Thompson River .....		6,412 02			6,412 02
Quatsino City .....		125 38			125 38
Salmon River .....		4,995 02			4,995 02
Sidney Harbour .....		6,252 01			6,252 01
Skeena River .....		5,404 44			5,404 44
Spallumcheen River .....		1,927 22			1,927 22
Thetis and Kuper Island Passage .....	5,075 55				5,075 55
Victoria Harbour .....	16,888 69				16,888 69
William's Head, quar. station, wharf, &c. ....			8,390 40		8,390 40
Generally .....				1,777 81	1,777 81
Totals, British Columbia .....	64,921 39	95,020 64	9,892 71	14,714 31	184,549 05
<i>Yukon Territory.</i>					
Lewis and Yukon Rivers .....		6,291 13			6,291 13
Totals, Yukon .....		6,291 13			6,291 13
<i>Harbours and Rivers Generally.</i>					
General expenses of staff, &c. ..	5,501 59			8,833 76	14,335 35
<b>DREDGES AND DREDGING PLANT.</b>					
Maritime Provinces .....		223,150 20	(a)		223,150 20
Ontario and Quebec .....		109,624 33	66,125 79		175,750 12
Manitoba .....		13,284 87	4,934 70		18,219 57
British Columbia .....		24,304 83	4,799 19		29,104 02
Totals, Dredges and Dredging plant .....		370,364 23	75,859 68		446,223 91
<b>SLIDES AND BOOMS</b>					
River Saguenay .....		24,938 16			24,938 16
River St. Maurice .....		40,200 72	14,060 53	46,496 18	100,757 43
River Richelieu (Belœil) .....				85 45	85 45

(a) Cost of repairs (\$12,625.78) apportioned with dredging, see various harbours in Maritime Provinces.

5-6 EDWARD VII., A. 1906

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
SLIDES AND BOOMS— <i>Con.</i>					
Ottawa District—					
Ottawa River . . . . .			7,736 54		7,736 54
Riv. du Lievre . . . . .		875 00			875 00
Gatineau River . . . . .			8,266 36	4,157 29	12,423 65
Coulonge River . . . . .			2,575 46		2,575 46
Black River . . . . .			1,957 89		1,957 89
Dumoine River . . . . .			5,475 01		5,475 01
Madawaska River . . . . .			1,275 63		1,275 63
Petewawa River . . . . .			3,106 91		3,106 91
Trent and Newcastle District . . . . .			1,415 99	2,194 97	3,610 96
Collection Slide and Boom Dues Generally . . . . .				4,249 38	4,249 38
Totals, Slides and Booms . . . . .		66,013 88	45,870 32	83,474 75	195,358 95

## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>ROADS AND BRIDGES.</b>				
<i>Quebec and Ontario.</i>				
Bryson Bridge (Ottawa River).....		2,233 39		2,233 39
Ottawa, Laurier Bridge.....	2,160 78			2,160 78
Ottawa City bridges and streets maintained by Government—				
Chaudiere bridges and approaches.....	3,162 63	2,379 26		5,541 89
Sappers and Dufferin bridges and Wellington street.....	2,887 73		6,036 87	8,924 60
Lighting all the above.....			2,440 00	2,440 00
Portage du Fort Bridge, Ottawa river.....	8,694 07			8,694 07
York Bridge, Grand River.....		1,210 55		1,210 55
<i>North-west Territories.</i>				
Battleford Bridge, Battle River.....	2,137 76			2,137 76
Edmonton Bridge, Saskatchewan River.....		95 85		95 85
Calgary Bridge, Bow River.....		484 30		484 30
Lesser Slave Lake and Sturgeon Lake, winter road.....	800 00			800 00
Lethbridge, Belly River.....	30,489 85			30,489 85
Macleod Bridge, Old Man's River.....	23,075 42			23,075 42
Peace River and Pelly River, pack trail.....	2,737 46			2,737 46
Generally, N. W. T.....			3,322 21	3,322 21
Totals, Roads and Bridges.....	76,145 70	6,403 35	11,799 08	94,348 13
<b>TELEGRAPH LINES.</b>				
<i>Nova Scotia.</i>				
Big Bras d'Or to Upper Kempt Head, Boularderie Island.....	637 82			637 82
Cape Breton Lines.....			10,254 45	10,254 45
St. Peters to Louisburg, Seatarie and North Sydney.....	37 00			37 00
St. Peters, Canso.....	763 10			763 10
<i>Prince Edward Island.</i>				
P. E. Island and mainland (subsidy).....			5,583 65	5,583 65
<i>New Brunswick.</i>				
Chatham to Tracadie.....	2,000 00			2,000 00
Deer Island to Eastport, Me.....	2,932 41			2,932 41
Bay of Fundy line.....			2,107 31	2,107 31
Eseuminac line.....			755 67	755 67
<i>Quebec.</i>				
Anticosti, Gaspé lines.....		1,436 59	3,646 88	5,083 47
Belle Isle, Chateau Bay (Marconi system).....	1,135 04			1,135 04
Father Point (subsidy).....			500 00	500 00
Isle aux Coudres line (subsidy).....			150 00	150 00
Island of Orleans, Isle aux Grues and Grosse Isle.....	3,383 16		4,158 04	7,541 20
North Shore, east of Bersimis.....	19,645 65	1,957 28	13,376 22	34,979 15
“ west “.....	848 63		8,723 17	9,571 80
Magdalen Islands lines.....	2,360 19		3,073 34	5,433 53
Saguenay River lines, east side.....	1,925 36			1,925 36
“ “ west side.....	406 08			406 08
Generally Gulf and Maritime Provinces.....			12,162 89	12,162 89
“ expenses ss. 'Tyrian'.....			37,572 56	37,572 56

5-6 EDWARD VII. A. 1906

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>TELEGRAPH LINES—Continued.</b>				
<i>Ontario.</i>				
Pelee Island line .....		3,088 56	236 78	3,325 34
<i>North-west Territories.</i>				
Banff Telephone System.....	897 92			897 92
Edmonton to Athabaska Landing.....	2,217 09			2,217 09
Edmonton, Edmonton Indian Agency.....	671 76			671 76
Qu'Appelle-Edmonton-Moosejaw line .....	5,468 47			5,468 47
Victoria-Andrew loop line.....	673 37			673 37
Wood Mountain to Willow Bunch.....	4,094 75			4,094 75
Generally, N. W. T. ....			30,703 68	30,703 68
<i>British Columbia and Yukon District.</i>				
Alberni-Cape Beale.....			774 00	774 00
Alberni-Clayoquot.....			3,134 34	3,134 34
Ashcroft-Dawson .....		1,526 25	227,824 80	229,351 05
Golden-Windermere .....			3,186 62	3,186 62
Kamloops-Nicola.....			861 03	861 03
Nicola-Penticton .....	15,775 98		192 20	15,968 18
Nanaimo-Comox.....			3,443 38	3,443 38
Vancouver-Saltspring.....	350 00		174 46	524 46
Vernon-Kelowna.....	5,499 65		292 15	5,791 80
Victoria-Cape Beale.....			4,826 78	4,826 78
Generally, British Columbia .....			1,354 62	1,354 62
Telegraph service, generally .....			3,263 23	3,263 23
Totals, Telegraphs.....	71,723 43	8,008 68	382,332 25	462,064 36
<b>MISCELLANEOUS.</b>				
Arbitrations and awards.....			505 00	505 00
Cement testing laboratory.....			3,002 02	3,002 02
Surveys and inspections—				
Georgian Bay to Montreal waterway.....			251,540 96	251,540 96
Ottawa River, headwaters and tributaries.....			21,779 86	21,779 86
Generally.....			61,042 57	61,042 57
Secretary and accountant's staff.....			43,996 54	43,996 54
Chief architect's staff.....			37,279 66	37,279 66
Chief engineer's staff.....			83,724 93	83,724 93
Superintendent telegraph service staff.....			4,540 00	4,540 00
Departmental photographer .....			800 00	800 00
Technical and other books of reference.....			499 90	499 90
Transportation commission.....			13,309 98	13,309 98
International Waterways Commission.....			6,163 43	6,163 43
Gratuity to widow of late A. R. Parent.....			137 25	137 25
" family of late L. Moore .....			70 00	70 00
" heirs of late M. A. Trottier.....			120 00	120 00
" widow of late Jos. Loiseau .....			100 00	100 00
" " J. E. Hardy .....			240 00	240 00
" " J. H. Rouleau .....			122 00	122 00
" " A. Leturmy .....			120 00	120 00
" " David Scott .....			250 00	250 00
" " W. J. Ferguson.....			120 00	120 00
" " G. A. Day .....			300 00	300 00
" representatives late Tim. Daly.....			124 00	124 00
" widow of late J. W. Fraser .....			333 33	333 33
" " P. Savard .....			152 00	152 00
" " Wm. O'Keefe .....			65 00	65 00
" Fred L. Eaton.....			1,000 00	1,000 00
Public Works agency B.C.....			1,147 76	1,147 76
Totals, Miscellaneous .....			532,586 19	532,586 19

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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
RECAPITULATION.					
Totals Public Buildings—					
Nova Scotia . . . . .		133,268 55	12,164 70	31,313 03	176,746 28
Prince Edward Island. . . . .		10,055 35	1,062 48	6,062 01	17,179 84
New Brunswick. . . . .		85,451 37	7,165 55	28,099 73	120,716 65
Maritime Provinces generally . . . . .				1,253 20	1,253 20
Quebec. . . . .		346,549 02	28,372 88	97,692 90	472,614 80
Ontario . . . . .		924,429 11	296,748 80	350,963 56	1,572,141 47
Manitoba. . . . .		293,544 60	15,357 53	24,616 46	333,518 59
North-west Territories . . . . .		117,045 19	11,750 38	24,973 27	153,768 84
British Columbia . . . . .		61,155 43	10,311 98	27,533 09	99,000 50
Yukon . . . . .		5,368 37	697 21	91,063 08	97,128 66
Public Buildings generally. . . . .				23,346 82	23,346 82
Totals, Harbours and Rivers—					
Nova Scotia . . . . .	34,654 19	314,335 15	68,450 19	12,977 47	430,417 00
Prince Edward Island. . . . .	17,862 29	24,531 60	5,691 44	1,367 93	49,453 26
New Brunswick. . . . .	53,321 39	165,812 58	19,832 96	2,977 48	241,944 41
Quebec. . . . .	258,424 84	913,211 68	66,095 95	40,861 51	1,278,593 98
Ontario . . . . .	546,240 47	616,307 54	55,657 51	19,074 97	1,237,280 49
Manitoba. . . . .	31,715 18	21,796 17	5,142 38	2,977 12	61,630 85
North-west Territories . . . . .		1,517 06			1,517 06
British Columbia . . . . .	64,921 39	95,020 64	9,892 71	14,714 31	184,549 05
Yukon . . . . .		6,291 13			6,291 13
Harbours and Rivers generally . . . . .	5,501 59			8,833 76	14,335 35
Totals, dredges and dredging plant. . . . .		370,364 23	75,859 68		446,223 91
“ slides and booms . . . . .		66,013 88	45,870 32	83,474 75	195,358 95
“ roads and bridges. . . . .		76,145 70	6,403 35	11,799 08	94,348 13
“ telegraph lines. . . . .		71,723 43	8,008 68	382,332 25	462,064 36
“ miscellaneous. . . . .				532,586 19	532,586 19
Grand totals of expenditure. . . . .	1,012,641 34	4,719,937 78	750,536 68	1,820,893 97	8,304,009 77

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## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
<i>Nova Scotia.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Amherst post office, &c. . . . .		459 18	379 26	517 65	42 00	1,398 09
Annapolis post office. . . . .		432 54	213 64	147 00	40 00	833 18
Antigonish post office. . . . .		403 40	114 08	56 00	10 00	583 48
Arichat post office, &c. . . . .		154 60	78 50	24 31		257 41
Baddeck post office. . . . .		263 15	133 50	51 90		448 55
Dartmouth post office. . . . .		250 00	102 69	129 71	22 40	504 80
Digby post office. . . . .		414 05	189 35	296 44	60 00	959 84
Guysboro' post office. . . . .		7 76	427 50	57 32		492 58
Halifax, Asst. Rec. Gen. office	1,217 40		41 37	142 92		1,401 69
" custom house (new) . . . . .		147 50		219 00		366 50
" Dominion building. . . . .		2,469 00	951 03	3,041 91	134 03	6,595 97
" drill shed. . . . .		1,200 00				1,200 00
" examining warehouse. . . . .	1,500 00	463 06	203 91	70 60	115 49	2,353 06
" engineer's office. . . . .	350 00					350 00
" immigrant shed. . . . .		600 00	349 39	597 47		1,546 86
" immigrant hospital. . . . .	100 00					100 00
Kentville post office, &c. . . . .		410 50	260 08	183 25	62 50	916 33
Liverpool post office, &c. . . . .		407 56	216 42	110 99	18 00	752 97
Lunenburg post office, &c. . . . .		331 45	226 75	109 90	59 00	727 10
Middleton armoury. . . . .	12 50					12 50
New Glasgow post office, &c. . . . .		407 10	356 15	374 83	100 00	1,238 08
North Sydney post office. . . . .		446 66	268 75	513 97	40 00	1,269 38
Pictou custom house. . . . .			168 92	10 32	50 00	229 24
" post office. . . . .		549 04	202 37	343 78	50 00	1,145 19
Springhill post office, &c. . . . .		471 84	259 00	231 89	45 00	1,007 73
Sydney post office, &c. . . . .		426 79	261 46	616 76	36 00	1,341 01
Truro post office, &c. . . . .		420 16	260 38	341 88	30 00	1,052 42
Windsor post office. . . . .		416 58	393 10	102 50	50 00	962 18
Yarmouth post office. . . . .		402 49	296 50	459 90	108 00	1,266 89
Total for N.S., (carried to Statement A, page 7.)	3,179 90	11,954 41	6,354 10	8,752 20	1,072 42	31,313 03
<i>Prince Edward Island.</i>						
Charlottetown, Dom. building. . . . .		2,177 31	598 61	1,567 09	225 00	4,568 01
" engineer's office. . . . .	200 00					200 00
Montague post office. . . . .		168 45	94 11	30 50		293 06
Summerside post office. . . . .		427 25	378 15	195 54		1,000 94
Total for P.E.I., (carried to Statement A, page 7.)	200 00	2,773 01	1,070 87	1,793 13	225 00	6,062 01
<i>New Brunswick.</i>						
Bathurst post office, &c. . . . .		467 98	471 25	147 97		1,087 20
Carleton, St. John, post office. . . . .		100 00	53 50		8 50	162 00
Chatham post office, &c. . . . .		367 71	359 77	369 01	18 00	1,114 49
Dalhousie post office, &c. . . . .		403 84	278 14	21 32		703 30
Fredericton post office, &c. . . . .		431 46	315 16	595 89	74 50	1,417 01
Marysville post office. . . . .		150 00	122 59	28 46	25 00	326 05
Moncton post office, &c. . . . .		400 00	375 48	460 91	134 00	1,370 39
Newcastle post office, &c. . . . .		408 95	420 82	215 10		1,044 87
Richibucto post office, &c. . . . .		348 36	496 10	152 42		996 88
St. John custom house. . . . .	22 00	1,969 24	1,762 32	338 61	713 40	4,805 57
" immigrant building. . . . .	952 65	1,234 55	1,417 37	895 32	156 14	4,656 03
" post office. . . . .	32 73	1,352 52	814 08	1,780 75	704 90	4,684 98
" savings bank. . . . .		0 50	307 11	55 18	24 06	386 85
Tracadie lazaretto. . . . .		316 50	1,418 34			1,734 84
St. John quarantine station. . . . .				908 94		908 94
St. Stephen's post office, &c. . . . .		407 64	165 60	339 60	80 00	992 84
Sussex post office, &c. . . . .		302 00	429 09	108 24		839 33
Woodstock post office, &c. . . . .		424 00	248 91	161 25	34 00	868 16
Total for N.B., (carried to Statement A, page 8.)	1,007 38	9,085 25	9,455 63	6,578 97	1,972 50	28,099 73



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## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
<i>Quebec.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Aylmer post office. . . . .		60 00	300 70	160 00	41 25	561 95
Berthierville post office . . . . .		15 92	173 52	50 46	33 00	272 90
Buckingham public building . . . . .		125 20	220 70	129 90	37 20	513 00
Coaticook public building. . . . .		412 20	262 17	194 64	40 00	909 01
Drummondville public bldg. . . . .		300 00	205 38	58 50	17 07	580 95
Dundee custom house. . . . .			31 75			31 75
Granby public building . . . . .		322 23	256 75	140 13	150 00	869 11
Grosse Isle quarantine station. . . . .				10 00		10 00
Fraserville public building. . . . .		313 70	335 00	76 65	60 00	785 35
Hochelaga post office . . . . .		223 60	228 75	160 83	60 14	673 32
Hull post office . . . . .		150 00	452 65	512 81	244 65	1,360 11
Joliette post office . . . . .		418 23	379 91	110 69	108 00	1,016 83
Lachine post office . . . . .		114 60	157 20	58 25	36 90	366 95
Laprairie post office. . . . .		110 15	198 81	28 33	40 00	377 29
L'Assomption post office . . . . .		169 45	233 75		30 00	433 20
Montreal clerk of works office. . . . .	35 00					35 00
“ civil service examin. “ office. . . . .	150 00					150 00
“ custom house . . . . .		2,614 55	990 96	572 74	321 13	4,499 38
“ Dom. public bldgs. . . . .	192 20	1,703 00				1,895 20
“ drill hall. . . . .		787 50				787 50
“ examining wareh'se. . . . .	55 00	6,472 86	2,307 37	3,352 45	641 91	12,829 59
“ engineer's office. . . . .	525 00					525 00
“ immigration office . . . . .	916 65		72 69			989 34
“ inland revenue office . . . . .		647 64	298 42	159 33	101 91	1,207 30
Montreal P.O. and Branches—						
Main office. . . . .		13,493 05	1,099 95	8,231 16	950 66	23,774 82
Amherst st. branch. . . . .	75 00					75 00
Metcalfe st. branch. . . . .	89 75					89 75
St. Catherine st. branch. . . . .	2,750 00					2,750 00
(Station B)						
St. Lawrence st. branch. . . . .	66 67					66 67
Westmount branch . . . . .	150 00					150 00
Windsor station branch. . . . .	1,300 00					1,300 00
Montreal Public Works Purchaser's office . . . . .	21 66					21 66
Quebec citadel buildings . . . . .	32 50	476 95	764 33	116 38		1,390 16
“ clerk of works office. . . . .	45 00	131 00				176 00
“ culler's office . . . . .		541 75	386 85			928 60
“ custom house. . . . .		608 18	1,067 43	429 18	852 50	2,957 29
“ examining warehouse. . . . .		1,566 00	893 11	77 88	450 00	2,986 99
“ engineer's office. . . . .	268 50					268 50
“ immigration office. . . . .	23 50	70 00	552 58	686 65		1,332 73
“ observatory . . . . .			28 59	57 85		86 44
“ post office building. . . . .		1,685 67	854 33	697 77	750 00	3,987 77
“ Queen's wharf building . . . . .			673 20		750 00	1,423 20
“ weights & meas. office. . . . .			71 75			71 75
“ immigrant hospital. . . . .			1,415 68	793 24		2,208 92
Poupore, engineer's office. . . . .	60 00					60 00
Peribonka immigrant shed. . . . .		300 00	78 37	10 50		388 87
Richmond post office, &c. . . . .		357 81	278 78	168 10	25 00	829 69
Rimouski public buildings . . . . .		166 94	227 36	41 12		435 42
Roberval immigration shed . . . . .		333 58	159 00	19 75	15 00	527 33
Sherbrooke post office, &c. . . . .		486 03	604 89	509 70	50 00	1,650 62
Sorel post office, &c. . . . .		517 35	433 45	840 77	250 00	2,041 57
St. Eustache post office . . . . .	144 00					144 00
St. Henri post office . . . . .			119 46	83 88	29 28	232 62
St. Hyacinthe post office . . . . .		526 11	37 08	492 65	150 00	1,205 84
St. Hyacinthe inland revenue building . . . . .		314 74	533 66	20 54	50 00	918 94
St. Jérôme post office, &c. . . . .		410 00	362 71	197 52	54 00	1,024 23
St. John's post office, &c. . . . .		350 00	102 60	187 50	60 00	700 10
St. Roch post office. . . . .			17 43	33 43		50 86

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## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Quebec—Concluded.</i>						
Thetford Mines post office . . . . .		32 55	283 62		4 33	32 50
Three Rivers custom house . . . . .		460 93	527 63	177 00	194 00	1,351 56
“ clerk of works of . . . . .	96 00	24 00				120 00
“ post office . . . . .		571 70	294 25	352 43	62 00	1,280 38
Valleyfield post office . . . . .	363 87		349 05	40 43		753 35
Victoriaville post office . . . . .	1 00	132 10	295 07	232 74	58 38	719 29
West Farnham post office . . . . .		9 48	94 80	102 56	10 00	216 84
Total for Quebec (carried into Statement A, page 9)	7,361 30	38,526 75	19,684 90	20,347 18	6,786 16	92,706 29
<i>Ontario.</i>						
Alexandria post office, &c . . . . .		67 50	185 07			252 57
Almonte post office, &c . . . . .		408 15	209 80	82 97	150 00	850 92
Amherstburg post office, &c . . . . .		409 45	235 94	162 33	35 00	842 72
Arnprior post office, &c . . . . .		400 75	491 95	158 47	33 12	1,084 29
Barrie post office . . . . .		430 10	235 25	174 82	50 00	890 17
Belleville post office . . . . .		674 18	718 38	761 85	83 25	2,237 66
Berlin post office . . . . .		433 96	302 73	263 05	20 40	1,020 14
Brampton post office . . . . .		418 55	184 20	266 62	30 50	899 87
Brantford post office . . . . .		627 59	477 86	249 82	38 00	1,393 27
Brockville post office . . . . .		400 70	419 75	725 50	170 00	1,715 95
Bowmanville post office . . . . .		167 13	250 25	37 62		455 00
Carleton Place post office . . . . .		304 90	177 50	127 35		609 75
Cayuga post office . . . . .		57 50	124 73	33 54		215 77
Chatham post office . . . . .		545 88	276 99	250 82	42 50	1,116 19
Clinton post office . . . . .		75 08	161 65	157 53		394 26
Cobourg post office, &c . . . . .	270 00	412 53	226 15	320 82	40 29	1,269 79
Cornwall post office . . . . .		480 00	322 00	699 10	112 50	1,613 60
Deseronto post office . . . . .		440 77	289 69	378 85	39 00	1,148 31
Dundas post office . . . . .	625 00	50 00	53 87	60 00		788 87
Fort William post office, &c . . . . .		354 63	591 40	32 20	56 34	1,034 57
Galt post office . . . . .		423 43	246 29	249 48	38 25	957 45
Gananoque custom house . . . . .			148 40	94 00		242 40
“ post office . . . . .			114 83	141 00	5 00	260 83
Goderich post office, &c . . . . .		421 45	288 05	185 28	75 00	969 78
Guelph post office, &c . . . . .	90 00	410 00	228 17	277 66	37 44	1,043 27
Hamilton drill shed . . . . .		315 00				315 00
“ post office, &c . . . . .		2,003 15	1,270 75	2,027 07	1,340 80	6,641 77
Ingersoll post office, &c . . . . .		437 10	322 66	323 12	25 87	1,108 75
Kenora post office, &c . . . . .		412 60	523 18	277 59	70 85	1,284 22
Kingston custom house . . . . .		193 20	337 25	115 36	61 20	707 01
“ drill hall . . . . .		600 00				600 00
“ exam. warehouse . . . . .			81 30		12 40	93 70
“ inland revenue office . . . . .					21 58	21 58
“ military college . . . . .		3,307 50		45 70		3,353 20
“ post office . . . . .		311 21	268 00	1,015 79	48 06	1,643 06
“ Wolfe Island cus- toms office . . . . .			46 90			46 90
Lindsay post office, &c . . . . .		400 00	222 16	56 25	37 50	715 91
London custom house . . . . .		1,105 53	798 49	637 55	140 00	2,681 57
“ engineer's office . . . . .	375 00					375 00
“ post office . . . . .		942 07	785 51	1,266 66	80 00	3,074 24
“ drill hall . . . . .		420 00				420 00
Napanee post office, &c . . . . .		470 23	161 83	150 40	69 07	851 53
Niagara Falls post office, &c . . . . .		436 90	226 90	162 50	37 00	863 30
Orangeville post office, &c . . . . .		400 00	215 88	76 50	20 00	712 38
Orillia post office, &c . . . . .		334 60	197 00	87 09	32 50	651 19
Ottawa astronomical observatory . . . . .			681 23			681 23

## SESSIONAL PAPER No. 19

## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Ontario—Con.</i>						
Ottawa bacteriological laboratory			70 00			70 00
" experimental farm			1,607 03	345 65		1,952 68
" geological museum	600 00		973 04	607 28		2,180 32
" Major's Hill greenhouse	300 00		420 00	15 50		735 50
" national art gallery, &c.			280 00	45 00		325 00
" parliamentary and departmental buildings	38,225 85		41,645 60	20,331 09		100,202 54
" post office	1,800 00		1,507 14	471 58		3,778 72
" printing bureau	5,747 32		10,132 55	475 96		16,355 83
" supreme court	1,536 00		817 54	412 00		2,765 54
" workshops (D.P.W.)	300 00		875 00			1,175 00
<i>Ottawa, rented buildings—</i>						
Albert St. (Railway Mail Service offices)	900 00			50 00		950 00
Metcalfe St. (Labour Dept.)	1,200 00			152 00		1,352 00
Metcalfe St. (Militia D.O.C. offices)	145 83					145 83
Metcalfe St. (Surveyor Gen. offices)	3,750 00	300 00	383 14	315 00		4,748 14
Queen St. (Dept. Pub. W'ks)	137 50					137 50
Queen St., Woods Building (Railway Com., Customs, &c.)	6,625 00	600 00				7,225 00
Queen St. (Exhibition Commissioner's office)	1,000 00			99 00		1,099 00
Queen St., Imperial Building (Immigration, &c.)	4,200 00	600 00	48 00	311 00		5,159 00
Rideau St., Corry Building (Auditor General's office and Marine and Fisheries)	2,113 33			181 66		2,294 99
Slater St., Woods Building (Militia Dept.)	11,040 00	1,200 00	1,451 22	1,217 27		14,908 49
Sparks St. (Census, &c.)	6,500 00	1,500 00	630 00	266 50		8,896 50
Sparks St. (P. O. Dept.)	195 00			57 50		252 50
Sparks St. (P. W. Dept.)	885 00					885 00
Sparks St. (Chief Analyst's office)			204 08			204 08
Sussex St. (Geological Survey)	600 00					600 00
Sussex St. (French Translators' offices)	600 00		102 05	141 02		843 07
Sussex St. (Marine Stores)			372 00			372 00
Wellington St. (Chief Astronomer's offices)	2,200 00			67 50		2,267 50
Wellington St. (Langevin Block)	15 00					15 00
Wellington St. (Customs Statistical offices)	1,500 00	300 00	420 00	263 50		2,483 50
Wellington St. (Public W'ks workshops)	1,939 77	876 00	641 64	198 23		3,655 64
Wellington St. (N.W.M. Police stores)	1,425 00			105 00		1,530 00
Wellington St. (Dairy Commissioner's office)			280 00			280 00
Wellington St. (Gas Inspector's office)				13 68		13 68
Paris post office, &c.		417 00	140 07	109 53	63 60	730 20
Pembroke post office, &c.		404 05	318 50	198 00	28 00	948 55
Peterboro', custom house		307 00	283 15	70 81	75 00	710 96
" post office		333 93	331 98	537 50	50 00	1,270 41
Petrollea post office, &c.		410 95	225 66	32 65	34 76	704 02
Pictou post office, &c.		428 68	244 00	147 83	27 00	847 51
Port Arthur post office, &c.		303 20	261 23	129 20		693 63

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## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.]	Heating.	Lighting.	Water.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Ontario—Con.</i>						
Port Colborne post office, &c.		253 85		99 75	12 50	366 10
Port Hope post office, &c.		435 50	275 20	217 40	21 93	950 03
Prescott custom house			103 50			103 50
“ post office		411 30	225 25	204 62	120 00	961 17
Sarnia post office, &c.		434 98	356 60	227 14	66 00	1,084 72
Smith's Falls post office, &c.		349 80	214 50	96 50	106 25	767 05
Stratford post office, &c.		665 62	394 40	248 68	102 17	1,410 87
Strathroy post office, &c.		430 55	233 65	239 10	10 80	914 10
St. Catharines post office, &c.		423 20	337 86	171 05	76 91	1,009 02
St. Thomas post office, &c.		440 55	325 00	354 30	29 92	1,149 77
Sault Ste. Marie post office, &c.			176 57			176 57
Toronto civil ser. exam. office.	101 00					101 00
“ custom house.		1,637 27	695 63	267 63	41 99	2,642 52
“ Dom. pub. build. gen.		1,200 00				1,200 00
“ drill shed		1,193 55				1,193 55
“ engineer's office	605 00					605 00
“ examining warehouse.		4,453 79	1,021 96	386 44	69 83	5,932 02
“ inland revenue office.		670 05	311 61	144 46	34 13	1,160 25
“ receiver gen. office.		365 00		89 52		454 52
“ post office.		7,919 38	1,768 47	5,866 09	510 30	16,064 84
“ post office, stable	156 00					156 00
“ post office, station B.	758 00					758 00
“ steamboat insp. office.	562 50					562 50
“ Junction post office.		17 90				17 90
Trenton post office, &c.		454 45	208 85	205 00	75 00	943 30
Walkerton post office, &c.		412 35	274 83	151 80	31 00	869 98
Windsor post office, &c.		829 50	510 50	733 03	96 00	2,169 03
“ drill hall		400 00				400 00
Woodstock post office		471 20	310 64	430 75	35 20	1,247 79
Totals for Ontario (carried to Statement A, page 11)	50,513 93	100,863 09	85,509 58	49,634 56	4,771 71	291,292 87
<i>Manitoba.</i>						
Brandon experimental farm.			322 00			322 00
“ immigrant building.			235 00	54 09	25 83	314 92
“ post office, &c.		629 40	1,049 82	946 39	100 00	2,725 61
Dauphin Dom. lands office	1,107 00					1,107 00
“ immigration bldg.			76 50			76 50
East Selkirk immign. bldg.	5 00		177 00			182 00
Minnedosa Dom. lands office	165 00		150 79			315 79
Portage LaPrairie post office.		404 45	591 31	244 15		1,239 91
Winnipeg clerk of works office.	50 00	94 00				144 00
“ custom house.		248 00	756 49	87 89	64 87	1,157 25
“ Dominion lands office			271 35	17 49	45 24	334 08
“ Dom. public build- ings generally.		69 58				69 58
“ engineer's office.	292 00					292 00
“ examining wareh'se.		104 00	548 35	81 88	44 36	778 59
“ immigrant shed.	468 87		1,420 32	200 55	13 65	2,103 39
“ inspector W. & M. off.	710 00					710 00
“ post office.		4,249 19	3,733 71	3,569 60	767 68	12,320 18
“ immigrant hospital.					13 18	13 18
Teulon, immigrant building.	225 00					225 00
Totals, Manitoba, (carried to Statement A, page 12)	3,022 87	5,798 62	9,332 64	5,202 04	1,074 81	24,430 98

## SESSIONAL PAPER No. 19

PART II.—STATEMENT B.—EXPENDITURE—*Continued.*

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>North-west Territories.</i>						
Alameda, dom. lands office. . . . .	195 00		150 09			345 09
Battleford, dom. lands office. . . . .	50 00					50 00
“ immigrant bldg. . . . .			70 00			70 00
Calgary, court house, &c. . . . .		614 91	658 62	243 10	150 00	1,666 63
“ engineer's office . . . . .	240 00		336 18			240 00
“ immigrant building. . . . .			19 00			336 18
“ land & reg. office. . . . .		1 35				20 35
“ post office. . . . .		593 40	432 56	999 05	170 00	2,195 01
Camduff court house. . . . .		503 80	126 85	2 00		632 65
Didsbury, immigrant bldg. . . . .	72 00					72 00
Davidson, immigrant bldg. . . . .	100 00					100 00
Duck Lake, immgt bldg. . . . .			3 00			3 00
Edmonton court house. . . . .	810 00	605 70	54 40	79 00	22 50	1,571 60
“ dom. lands & reg. off. . . . .		419 66	185 00			604 66
“ immigrant shed. . . . .	765 00		114 24			879 24
“ post office. . . . .	42 00	8 50		206 05		256 55
Innisfield, immigrant bldg. . . . .	90 00					90 00
Indian Head, experm'tl farm. . . . .			453 40			453 40
Lacombe, immigrant bldg. . . . .	117 00		37 50			154 50
Lethbridge, court house and custom house . . . . .	52 50	0 60	32 50	18 49		104 09
“ immigt'n bldg. . . . .			86 00	117 06		203 06
“ post office. . . . .		584 40	125 50	92 18	45 00	847 08
Leduc, immigrant bldg. . . . .	80 00					80 00
Lloydminster, immigrant shed . . . . .			370 00			370 00
Medicine Hat, court house. . . . .		556 70	38 00	76 24	15 00	685 94
Macleod, custom house. . . . .			519 88	30 10		549 98
“ court house. . . . .	125 00	633 28	388 54	30 60		1,177 42
“ immigrant hall. . . . .	225 00		48 45			273 45
Moose jaw, court house. . . . .		367 98	182 22	3 00		553 20
Moosomin, court house. . . . .		680 85	450 19	19 24		1,150 28
Penoka, immigration bldg. . . . .	100 00					100 00
Prince Albert, Dom. lands and reg. office . . . . .		412 65	315 00	19 30		746 95
Qu'Appelle, immigrant bldg. . . . .			18 68			18 68
Red Deer, dom. lands office. . . . .	192 00		151 65			343 65
“ immigrant shed . . . . .			80 40			80 40
Regina, court house. . . . .		1,123 50	778 25	163 58		2,065 33
“ Dom. lands and reg. office. . . . .		612 56	553 17	77 92		1,243 65
“ immigrant bldg. . . . .	1 00		260 00	39 68		300 68
“ Lt. Gov. residence. . . . .		25 45		13 92		39 37
“ post office. . . . .		24 85	412 80	289 96		727 61
Saskatoon, immigrant bldg. . . . .			968 25			968 25
Strathcona, immgt. shed. . . . .	180 00		120 06			300 06
Wolseley, court house. . . . .		24 85	429 48	34 75		489 08
“ Dom. lands office. . . . .		540 00				540 00
Yorkton, Dom. lands office. . . . .	420 00					420 00
“ court house. . . . .		506 25		8 35		514 60
“ immigrant bldg. . . . .			339 60			339 60
Total, N.W.T., (carried to Statement A, page 13). . . . .	3,856 50	8,841 24	9,309 46	2,563 57	402 50	24,973 27
<i>British Columbia</i>						
Atlin, post office. . . . .		152 25	127 50	159 21		438 96
Agassiz, experimental farm. . . . .			101 92			101 92
Kamloops, post office. . . . .		35 45	382 02	661 99	36 00	1,115 46
Kamloops, dom lands office. . . . .		600 00				600 00

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## PART II.—STATEMENT B.—EXPENDITURE—Continued.

Name of Building.	Rents.	Salaries of and Supplies for Engineers.	Heating.	Lighting.	Water.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>British Columbia—Con.</i>						
Nanaimo, post office. ....		619 20	90 00	225 00	45 00	979 20
Nelson, public building. ....	16 35	630 00	570 06	787 75	72 00	2,076 16
New Westminster drill shed. .			108 24			108 24
“ post office. ....		681 05	923 36	524 67	40 12	2,169 20
Rossland, post office, &c. ....		627 05	818 01	720 00	129 69	2,294 75
Vancouver, dead letter office. .	225 00					225 00
“ drill hall. ....		1 50	24 75			26 25
“ examining warehse. ....	900 00		3 69	18 09		921 78
“ post office. ....		1,924 90	377 70	1,214 07	74 90	3,591 57
“ postal and express						
“ package office. ....	675 00					675 00
“ custom house. ....				386 55		386 55
Victoria, appraisers office. ....				6 40		6 40
“ barracks, D. O. C. ....			19 20			19 20
“ drill hall. ....			19 20			19 20
“ exam. ng warehouse. ....			5 00			5 00
“ old custom house. ....		604 00	94 50	75 82	18 00	792 32
“ military store. ....			12 80			12 80
“ post office. ....		3,148 80	48 40	1,147 63	49 40	4,394 23
“ old post office. ....		46 35	562 30		106 20	714 85
“ P. works office. ....	84 00					84 00
“ custom house. ....			46 00			46 00
“ marine hospital. ....			24 20			24 20
William's Head, quar. stn. ....	60 00		3,879 66			3,939 66
Total, B.C., (carried to Statement A, page 13.) .	1,960 35	9,070 55	8,238 51	5,927 18	571 31	25,767 90
Dominion buildings generally. .			979 76			979 76
<i>Yukon Territory.</i>						
White Horse, post office. ....		500 00	865 00	1,446 90	108 00	2,919 90
Dawson, sundry public build- ings, not apportioned. ....						88,143 18
Totals, Yukon, (carried to Statement A, page 13.) .		500 00	865 00	1,446 90	108 00	91,063 08

PART II.—STATEMENT C.—Showing amounts loaned by Government under the authority of special Acts of Parliament and upon the recommendation of the Hon. the Minister of Public Works, during the Fiscal Year 1904-05.

*No transactions of this nature during the fiscal year.*

A. G. KINGSTON,

*Accountant.*

PART III

REPORT

ON

PUBLIC BUILDINGS THROUGHOUT THE DOMINION

FOR THE FISCAL YEAR ENDED JUNE 30 1905

BY THE

CHIEF ARCHITECT





PUBLIC WORKS, CANADA,  
CHIEF ARCHITECT'S OFFICE,  
OTTAWA, January 10, 1906.

F. GÉLINAS, Esq.,  
Department of Public Works.

SIR,—I am sending you herewith, annual report of works executed under this branch during the year ended June 30, 1905.

D. EWART,  
*Chief Architect.*

## PROVINCE OF NOVA SCOTIA.

### ANTIGONISH.

#### PUBLIC BUILDING.

On June 15, 1905 a contract was entered into for the construction of this building on the post office site.

There is a main portion, 64 feet x 32 feet, exclusive of projections, two stories, basement and attic, a portion of which, 12 feet x 12 feet is carried up two stories higher and covered with a pyramidal roof, and a two story and basement adjunct 15 feet x 32 feet. The external walls are of brick on a stone basement, the roofs, floors and partitions wood. There is a brick safe on the ground floor and one on the first floor. The ground floor of the main building is for the post office and that of the adjunct for the examining warehouse and W.C.'s; on the first floor are offices, a brick vault and a W.C. room; the attic, six rooms and a bath-room for the caretaker, and the basement is for heating apparatus, fuel and storage.

Plans, &c., prepared by this department.

Clerk of works, Alexander MacGillivray.

Contractors, The Rhodes Curry Company.

### HALIFAX.

#### APPRAISER'S OFFICE.

Repairs were made to woodwork, plumbing and glazing under the supervision of C. E. W. Dodwell, resident engineer and inspector of buildings, Nova Scotia, Halifax.

#### CUSTOM HOUSE.

This building which was described in a previous report has been carried on continuously during the fiscal year and is still in progress.

#### ASSISTANT RECEIVER GENERAL'S OFFICE.

New furniture for the Inspector's office was purchased.

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## HALIFAX.

## DOMINION BUILDING.

The external surface of the stonework was thoroughly repointed and repaired, and repairs were made to copper roof covering—interior woodwork, lock boxes, electric wiring and furniture. The street letter boxes were painted and some new electric lamps, furniture and fittings were supplied.

Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Halifax, N.S.

## IMMIGRATION BUILDING.

A second story was added to the eastern portion of the building; a number of the partitions were removed and new partitions constructed; the building was jacked up, generally and extensively repaired and painted. Plans for hot water heating apparatus and an extension of the furnace room are prepared.

Plans prepared by this department and work carried out under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

Contractor for the additional story, &c. John MacInnes & Sons.

## LAWLOR'S ISLAND.

## QUARANTINE STATION.

Third-class 'A' Detention Building.—The whole south side of roof was shingled, the cubicles were finished, the doors hung and all painted. At the rear the slope of the cutting was levelled down and sowed with grass and the road gravelled.

First-class Detention Building.—The whole roof was re-boarded, papered and shingled.

Steward's Residence.—The whole roof was repapered and shingled. The old window sashes were re-puttied and painted, and many new panes put in. A new porch was built.

Storehouse.—The back room was ceiled, shelved and painted and the shingles on roof re-nailed.

The five hydrants were overhauled and repaired.

The main road was re-gravelled.

Work done under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Halifax, N.S.

## TRACHOMA HOSPITAL.

A site was acquired in the suburbs of Halifax, on the west side of Gottingen street, a part of the property known as the 'jail property,' having a frontage of 130 feet by a mean depth of 401 feet and a breadth in the rear of 165 feet.

## NORTH SYDNEY.

## PUBLIC BUILDING.

The post office fittings were largely added to and altered and some minor alterations made to the ground floor partitions.

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## SYDNEY.

## DOMINION BUILDING ADDITIONS.

This work which was described in my report of last year has been completed ; new post office fittings, electric wiring and heating apparatus supplied and the building occupied.

Plans, &c., prepared by this department.

Clerk of works, Duncan A. Gillis.

Contractors, The Rhodes Curry Company.

## SYDNEY MINES.

## PUBLIC BUILDING.

On September 29, 1904, a contract was entered into for the construction of this building on the corner of Fraser avenue and the Railway right of way. It is irregular in outline and measures 53 feet x 42 feet over all. It is to be of brick with stone dressings and stone basement ; two and a half stories and basement, excepting an octagonal tower on street corner which is to have an additional story in height. The basement floor is to be concrete but the remaining floors as well as the roof, stairs and partitions are to be wood ; the roof covering to be in part galvanized iron and in part tar and gravel. The basement is to contain the furnace and fuel rooms and storage ; on the ground floor are to be the post office, the examining warehouse, two vestibules, a brick vault, the stairway and a lavatory room ; on the first floor the Customs and Inland Revenue offices, stairway and lavatory room, and in the attic the caretaker's apartments.

Plans and specification prepared by this department.

Clerk of works, James Francis.

Contractor, James Reid.

## YARMOUTH.

## PUBLIC BUILDING.

On March 30, 1905, an agreement was entered into for the construction of an additional story on the one story adjunct in the rear, as well as for sundry changes in the interior arrangement.

Some repairs were made to fence and to warehouse entrances and new gate posts put in.

Clerk of works, Jas. E. Heustis.

Contractor for additions, Wm. E. Simms.

## PROVINCE OF NEW BRUNSWICK.

## CAMPBELLTON.

## POST OFFICE, &amp;C., BUILDING.

On September 30, 1904, a contract was entered into for the construction of this building which consists of a main portion two and one-half stories, of brick with stone foundation and on a stone basement, having a frontage of 50 feet on Water street, by a depth of 40 feet, and a one story brick adjunct on a stone basement in rear of

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the main portion measuring 16 feet x 25 feet. The basement is for heating apparatus, fuel and storage; the ground floor is for the post office and has also stairway, hall, vestibule and mail entrance. The adjunct is for the examining warehouse; the first floor is for Customs and Inland Revenue offices and the attic for caretaker's apartments. The basement walls are lined with brick, and the partitions of the basement and ground floor are of brick but the remaining partitions are wood. The floor of the basement is of concrete, but the remaining floors as well as the roof are of wood and the roof covering is slate on slopes and tar and gravel on deck. There is a lavatory and W.C. room on first floor and a bath-room in attic.

Plans, &c., prepared by this department.

Clerk of works, John Mackenzie.

Contractors, J. and D. A. Harquail.

### ST. JOHN.

#### PARTRIDGE ISLAND QUARANTINE STATION.

On August 26, 1904, contracts were entered into for the construction of a new hospital building and for two semi-detached pairs of detention buildings, all of which are to be two stories of wood on stone basement.

The hospital consists of a main portion, 39 feet x 25 feet for administration offices, two lateral wings, 27 feet long by 21 feet broad for wards, and a kitchen wing 28 feet x 15 feet in the rear. There is heating by hot water; plumbing with hot and cold water supply and drainage.

There are two blocks of two semi-detached detention buildings, each block 148 feet long x 20 feet broad. The basement of each building is restricted to a portion for furnace-room, 23 feet x 15 feet—the ground and first floor are alike, each containing a stairway hall, a sitting-room, a bath-room, a lavatory-room and eleven state-rooms, four of the state-rooms having eight berths, one having six berths and the remainder four berths each. There is hot water heating, hot and cold water service and drainage.

Plans, &c., for the foregoing buildings prepared by this department and work supervised by D. H. Waterbury, St. John, N.B.

Detention building 'B' had repairs to plumbing, furnace and stovepipe and had walls, partitions and ceilings of halls and lavatories painted two coats.

Detention building 'C' was painted as the foregoing building, had the windows re-putted, some ladders supplied and repairs made to plumbing.

The superintendent's residence had the exterior walls painted two coats, the roof coated with fire-proof paint and the ceilings, porch and verandah repaired.

In the Steward's residence the plaster of walls and ceilings was repaired, a new ceiling was put in hall, a number of rooms were papered, the hall, kitchen and porch were painted, the ceilings whitened and minor repairs done to woodwork, &c.

Some plumbing repairs were effected at the old hospital.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

#### CUSTOM HOUSE.

A large portion of the concrete floor of the Marine and Fisheries warehouse being broken and sunken was removed and replaced by new concrete. A lunch-room for the officials was fitted up in the building with plumbing, gas, furniture, &c., and a bath-room with all requisite furniture was fitted up for the caretaker. The customs vault had improvements in the way of shelving, drawers and fixtures and the express-room

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had increased accommodation provided and some new partitions as well, also shelving, counter, &c. Chandeliers were provided for three rooms. The main entrance doors were cleaned, rubbed, filled and varnished and the painted walls of halls and corridors cleaned. Repairs were made to masonry, lining and doors of furnace, the roof and hatches of observatory, the copper roof, gutters and pipes, the elevator of Customs Department, the plumbing, the bells, the locks, glazing, ironmongery, &c. Some articles of furniture were supplied to the office of the inspector of weights and to that of the agent of immigration.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## POST OFFICE.

The basement concrete floor where worn or broken was made good as were parts of the ceilings in inspector's flat and parts of the wood flooring there and in general delivery. A new door at Princess street entrance was hung complete. Some improvements were made in the offices of the customs postal service and some fittings and furniture supplied thereto. The rat-holes throughout building were plugged; the painted walls of ground floor were cleaned, the lobby ceiling kalsomined and the money order office door relettered. The copper roof was repaired, the flashing made good and the conductors and down-pipes cleaned. Repairs were made to hoist, plumbing, letter-boxes, heating apparatus, bells, glazing, lighting, ironmongery, blinds, furniture, &c. An office cabinet was supplied to the office of Superintendent of Railway Mail Service, and some minor articles of furniture supplied to the various offices.

Work supervised by D. H. Waterbury of this department, St. John, N.B.

## SAVINGS BANK.

Minor repairs were made to heating apparatus, flag-staff, &c., the interior walls were painted and varnished or papered and the ceilings whitened.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## IMMIGRATION BUILDINGS.

These consist of the immigration building, the property of the department and also the immigration quarters in No. 4, city warehouse under rental to this department. In the former a part was fitted up as hospital apartments involving new partitions, bed-rooms, dining-room and kitchen, furniture, ranges, baths, disinfectors, plumbing, closets, lavatories, a dumb waiter, extension of chimney, windows, blinds, stand pipes, hose, fire-extinguishers, wiring and electric lamps, painting walls, partitions and ceilings and repairs to woodwork, glazing, doors, ironmongery, &c. The matrons' apartments were extended and supplied with additional furniture, carpets, curtains, blinds, wash-tubs and plumbing as well as papering, painting and whitening walls and ceilings.

In the warehouse shed a large number of repairs were effected to the plumbing, drainage and heating as well as some improvements made to the last mentioned.

All done under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## ST. JOHN, NORTH (PORTLAND).

## POST OFFICE BUILDING.

On February 15, 1904, the building was sold by the government to Dr. J. E. Maher, but the office remained in the premises during the year. The post office has since been removed from this building.

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## ST. JOHN WEST (CARLETON).

## POST OFFICE.

Repairs were made to slate and flashing of roof, also to woodwork, outside doors and frames, plumbing and stoves. The interior walls of the building, main floor, were painted, the ceilings whitened and the woodwork varnished.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## ST. STEPHEN.

## PUBLIC BUILDING.

Excepting in the post office, all the internal walls, partitions and ceilings were cleaned and kalsomined. The main entrance doors and the doors of examining warehouse were cleaned and hard oil finished, the doors of customs long room and collector's long room were lettered. Five Grayson lamps were supplied.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## SUSSEX.

## ARMOURY.

Repairs were made to chimney, doors and woodwork under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## TRACADIE.

## LAZARETTO.

A portion of the basement was partitioned off to form two rooms and a steam disinfecter installed between them. Repairs were made to steam wash tubs, plumbing, heating apparatus, W. C's. and pump.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## WOODSTOCK.

## ARMOURIES.

A contract for the construction of this building was entered into on October 25, 1904. It is situated on Chapel street and extends back to Charlotte street. The site is that of the Woodstock skating rink, the roof and framing of which have been partly utilized in the drill hall and of the gunshed in rear. The building consists of a drill hall 95 feet long by 60 feet wide, flanked on both sides by leanto artillery wagon sheds; in front, on Chapel street, is a brick building of 98 feet frontage by 45 feet in depth of which the median 40 feet frontage is three stories and the remainder two stories, containing in the basement the heating furnaces and fuel; on the ground floor the engineers wagons, harness, orderly and C.O.; on the first floor the engineers armoury, lecture room, two infantry armouries, infantry orderly, infantry C.O. and lavatory; on the second floor the caretakers quarters. In the rear and reaching to Charlotte street is the artillery gunshed 30 feet by 95 feet, 30 feet by 60 feet of which has an additional story devoted to artillery armoury, artillery orderly room, C.O., and recreation room. The basement walls are to be concrete; the three story block on Chapel

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street is to have walls of brick and those of the remaining portion wood, brick veneered. The basement is restricted to a portion of the Chapel street block.

Plans, &c., prepared by this department.

Clerk of works, James E. Drysdale.

Contractor, Williamson Fisher.

## PROVINCE OF PRINCE EDWARD ISLAND.

## SOURIS.

## PUBLIC BUILDING.

On January 26, 1905, a site for this building was acquired by purchase, which has a frontage of 63 feet on Main street, by 100 feet in depth. Plans and specification of the building were prepared and tenders invited for the construction.

## PROVINCE OF QUEBEC.

## ACTON VALE.

## POST OFFICE BUILDING.

This building which was described in my report last year, has been carried forward nearly to completion and is being furnished, fitted up and supplied with a hot water heating system.

Plans, &c., prepared by this department.

Clerk of works, Octave Bernard.

Contractor, Joseph Bourque.

## LEVIS.

## CATTLE QUARANTINE.

A cupboard and a chimney were constructed in the employees building under the supervision of Ph. Bèland, clerk of works.

## PUBLIC BUILDING.

On February 3, 1905, a contract was entered into for the construction of this building which is to be 2½-stories of brick with stone dressings and on a stone basement measuring 64 feet in depth by 45 feet frontage and having in the rear a one story and basement adjunct 43 feet in depth by 20 feet in length. In the frontage is to be an engaged angle tower 15 feet square and having four stories and basement. The basement is to be for the heating, fuel and storage and shall contain a brick safe. The ground floor of the main portion, excepting 15 feet of the rear, is to be the post office; the rear of the main portion is to contain the stairway hall, a brick vault, mail entrance and lavatory; the adjunct is to be the examining warehouse. On the first floor are to be the customs long room, collectors office and two clerk's offices as well as a brick safe, lavatory room and stairway and hall, in the attic are to be the caretaker's apartments. The floor of the basement is to be concrete but the remaining floors as well as the roof and

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a number of the partitions on first and attic are to be of wood; the remaining partitions as well as the lining of the basement walls to be of brick. The sloping roofs are to be covered with sheet iron and the decks with tar and gravel.

Plans, &c., prepared by this department.

Clerk of works, L. Auger, architect.

Contractor, Joseph Couture.

### LONGUEUIL.

#### POST OFFICE.

This building which is situated on Chambly street has a frontage thereon of 38 feet by a depth of 29 feet. The contract for construction was entered into on September 28, 1904. It is a two and one-half story brick building, with stone dressings and a stone basement. The basement floor is concrete but the remaining floors as also the roof, cornice, partitions and stairs are of wood. The roof covering is of galvanized iron on the sloping portions and tar and gravel on the deck.

The basement is for heating furnace, fuel and storage; the ground floor contains the post office, staircase, hall and lavatory; the first floor has four rooms and a stairway, and the attic three rooms, a bath-room, a W.C. room and stairway.

Plans, &c., prepared by this department.

Clerk of works, Alfred Préfontaine, architect.

Contractor, Joseph Bourque.

### MONTREAL.

#### CUSTOM HOUSE.

A large amount of repairs were made to W.C.'s—new bowls and new urinals were supplied; tile floors and dados were put in, also slate divisions and new ventilating pipes.

A toilet-room was fitted up for the caretaker's use, with bath, &c.; plumbing repaired, galvanized iron water service pipes were fitted up, several basins, taps, &c., were added.

The electric light system was installed in a part of the building; furniture was supplied, such as tables, desks, chairs, carpets, &c.

Sidewalks were repaired; stones were levelled, joints filled in with cement, and the roof was repaired at different parts.

Work done under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

#### INLAND REVENUE BUILDING.

Repairs were made to lighting service and several lights added with mica chimneys and mantels, &c. Repairs were made to gas pipes, W.C.'s, urinals, &c., and the roof underwent repairs. All done under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

#### POST OFFICE.

General repairs were made to interior of building; the walls and ceilings were repaired and whitewashed; the woodwork, windows, doors, &c., were repaired and painted, and the hardwood re-varnished. Iron bars were put on several windows for protection. Furniture, such as tables, chairs, pigeon-holes, desks, &c., were supplied for office of Railway Mail Service. A window was altered into a door with storm-door, porch, &c., for the mail entrance on Fortification street. All the electric motors were



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repaired; steel cables for all the elevators were supplied and put in. Two special switches were also put in; bag racks and pigeon-holes were supplied to letter-carriers department.

Work executed under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

## POST OFFICE STATION 'B', ST. CATHERINE ST.

A sign was supplied, some gold lettering was done on windows and doors, a number of window blinds were supplied and put up, and iron grilles were put in window and doors at mail entrance under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

## LETTER CARRIERS BRANCH OFFICE, 333 ST. LAWRENCE ST.

The counter was repaired, walls and ceilings whitewashed, woodwork, doors and windows painted, under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

## EXAMINING WAREHOUSE.

Several extensive repairs were made; W.C.'s on each floor were paved with tile and had tile dados and slate divisions. Hot and cold water taps were fitted in each W.C. room; three new tubs with hot and cold water supplies were put in for laundry purposes; a copper-lined tub was installed with hot and cold water supplies for cleaning of windows. The six freight elevators were removed and replaced by a like number of new ones having steel inclosures; the heating apparatus was repaired; additional water closets were put in basement and in assistant caretaker's room. A complete system of electric light with arc lamps, &c., was installed. The roof was recovered with galvanized iron.

A complete cleaning was made; walls and ceilings were repaired and whitewashed; all woodwork, doors and sashes, inside and out, were painted; additions were made to counter with glazed divisions; shelving was supplied and put up in several departments; furniture was supplied, also linoleum and carpets for rooms and wire rugs for entrance halls. Stone sidewalks were levelled and joints filled in with cement.

Work executed under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

## NEW IMMIGRATION HOSPITAL.

Extensive repairs were done to this building; the walls and ceilings were repaired and whitewashed; the woodwork, &c., painted; new glazed partitions were put in several rooms; W.C.'s, urinals, baths, &c., were installed; furniture was supplied, such as chairs, tables, desks, cupboards, iron beds, spring beds, coal stove, kitchen utensils, &c. A special room for laundry was repaired; tubs with hot and cold water taps were installed. The water supply pipes were replaced by larger galvanized iron pipes in order to give sufficient pressure for the necessary requirements. Verandahs and stairs were repaired, also fences, gates, &c. A new sidewalk at immigrants private entrance was made. All the above named work done under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

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## QUEBEC.

## HIS EXCELLENCY'S RESIDENCE, CITADEL.

A coal bin was constructed, repairs were effected to plumbing, bells and lighting; some of the furniture was repaired and revarnished, and the interior of the building cleaned and put in order for the annual visit of Their Excellencies.

Work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

## ARTILLERY WORKSHOPS.

The eaves troughs which had been broken by ice were renewed under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## CUSTOM HOUSE.

Electric bells and clocks were installed; a new water service pipe from the city main was laid; several offices were repaired, papered and painted and some linoleum was laid.

Work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

## CULLERS OFFICE.

A new furnace was put in, a number of rooms were papered and painted, and some linoleum supplied, all under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## EXAMINING WAREHOUSE.

A new foundation and traps were put in elevator; several of the basement joists and beams were renewed; the second floor was relaid in birch and a new partition made.

Work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

## CULLERS OFFICE.

A new heating furnace was fitted up, the rooms were papered and painted, some linoleum and several articles of furniture were supplied and some minor repairs executed, all under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## IMMIGRATION BUILDING, LOUISE EMBANKMENT.

A large covered-way was built from shed to wharf; a furnace and radiators for heating the rooms of the officers and assistant matron rooms were fitted up, the building enlarged at front and rear and a pipe, with hand pump and tank, put in from well to shed.

Work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

## POST OFFICE.

All the flooring on first floor was renewed in brick and oiled and the offices of Superintendent of Railway Mail Service were papered and painted and had some furniture supplied. On second floor, two offices were prepared for the telegraph service, as also a lavatory containing a W.C. and wash basin, and partitions were put to divide these offices from the caretaker's apartments.

Work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

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## QUEBEC.

## TRACHOMA HOSPITAL—SAVARD PARK.

On May 19, 1904, a part of Cadastral lots 2427 and 2428 with the buildings thereon situated on the north shore of the River St. Charles was purchased. The hotel building was altered to fit it for hospital purposes. The basement was deepened, floored with concrete and had the outside walls under-pinned with concrete; the brick work of the outside walls, which were wooden, veneered with brick, was repaired, the arrangement of the partitions was largely altered; several of the floors were repaired and new doors and windows opened. Baths, water closets, sinks, basins, drainage and plumbing was put in ready for connection with the city aqueduct. Electric light was installed and the building cleaned, painted and tinted. On April 28, 1905, the building was destroyed by fire and the large music hall building had to be converted into a hospital. Wooden partitions, baths, plumbing, water supply, drainage and other necessary works were put in under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## WEIGHTS AND MEASURES OFFICES.

A heating apparatus was put in, the drainage renewed, the cellar cleaned and floored, birch floor laid over ground floor area, offices divided by glazed partitions, inside windows fitted, a large quantity of painting, graining and papering done, all by day labour under the supervision of Ph. Béland, of this department, Quebec, P.Q.

## ST. HENRI.

## POST OFFICE.

Caretaker's quarters were repaired, walls and ceilings whitewashed, woodwork, &c., painted, under the supervision of C. Desjardins, clerk of works, public buildings, Montreal, P.Q.

## ST. HYACINTHE.

## DRILL HALL.

On March 25, 1905, a contract was entered into for the construction of the building which is to be of brick with stone dressings and on a stone foundation. It is to consist of a drill hall, 147 feet by 75 feet inside dimensions having at one side a two story adjunct 166 feet by 27 feet exclusive of an octangular turret, 19 feet in diameter and three stories and basement in height, and of a one story and basement leanto 24 feet by 12 feet. A portion of the adjunct, 72 feet by 27 feet which includes the turret, is to be excavated for use as heating and fuel rooms; on the adjunct ground floor are to be twelve rooms for armouries and also lavatories, stairway, driveway, &c. On the first floor are to be shooting gallery, lecture hall, officers mess, sergeants mess, and caretaker's apartments. The partitions are to be principally of brick, the framing of hall roof and gallery of iron, the floor of the hall of wood block on a concrete foundation, the basement floor of concrete and the remaining floors, roof and some of the partitions of wood. The main hall roof is to be covered with galvanized iron and the remaining roofs with felt and gravel.

Plans, &c., prepared by this department.

Clerk of works, Francis Renaud.

Contractors, Paquet and Godbout.

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## ST. HYACINTHE.

## INLAND REVENUE BUILDING.

This building which was described in my report for 1904 is fitted up, furnished and supplied with hot water, heating and electric lighting.

Plans and specifications prepared by this department.

Clerk of works, John Arbour.

Contractors for construction, Paquet & Godbout.

Contractor for heating, J. Thérian.

## ST. LOUIS DU MILE END.

## POST OFFICE.

The contract for the construction of this building was entered into on August 23, 1904. It has two stories, basement and attic, and measures 42 feet by 41 feet exclusive of front porch. The basement is of stone as also are the angles of front elevation, the facing of ground floor front, the lower part of eaves cornice, the walls, cornice and steps of porch, the string courses, window sills, lintels, &c.; the remaining portions of the outside walls of brick. The basement floor is of concrete, but the remaining floors, the roof, partitions and stairway are of wood. The sloping roof is covered with slates and the deck with tar gravel. The upper members of the eaves cornice and the entire deck cornice are copper. There is ornamental wrought iron cresting to the deck roof. The basement is to contain the furnaces of the hot water heating system, fuel and storage; the ground floor is to contain post office, customs offices, examining warehouse and stairway; the first floor, five rooms, a bath room and stairway and the attic six rooms, &c.

Plans, &c., prepared by this department and work supervised by Perrault and Lesage, architects, Montreal, P.Q.

Contractor, J. B. Pauzé & Co.

## TERREBONNE.

## POST OFFICE.

On November 25, 1904, a contract was entered into for the construction of this building on the corner of St. Pierre and St. André streets, with frontages of 40 feet and 31 feet respectively. It is of stone and has two stories, basement and attic. The basement floor is of concrete but the remaining floors, as well as the roof, stairs and partitions are of wood. The roof is covered with steel shingles on the slopes and gravel on the deck.

The basement is for heating apparatus, fuel and storage; the ground floor contains the post office, the stairway, hall and lavatory; the first floor contains four rooms, the stairway and passage and the attic contains three rooms, besides a bath room, a W.C. room, a stairway and a passage.

Plans and specifications prepared and work supervised by Lacroix and Piché, architects, under the direction of this department.

Contractor, Ernest Paquet.

## THETFORD MINES.

## PUBLIC BUILDING.

This building was described in my report for 1904. It is now completed, and is being fitted up and supplied with a hot water heating system.

Plans, &c., prepared by this department.

Clerk of works, Ant. Grégoire.

Contractors for construction of building, Dussault & Pageau.

Contractor of heating system, A. Beauchêne.

Contractor for electric light installation, L. J. S. Rousseau.

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## THREE RIVERS.

## DRILL SHED.

On May 1, 1905, a contract was entered into for the construction of this building which is to be brick with stone dressings and stone basement walls and consists of a drill hall, 155 feet by 71 feet inside measurement with a two and three story adjunct along one side, the full length of the hall by 27 feet in breadth, containing in the basement, the furnace and fuel rooms, recreation room and store rooms, on the ground floor seven armouries, a C.O. room and Q.M. stores; on the first floor, lecture room, ante-room, &c., and, in the attic, which is restricted to 45 feet midway of the length, the caretaker's apartments.

The partitions are brick; the floors, excepting that in basement, which is concrete, are wood, as also are a number of the partitions, the roof and the stairways. The roof trusses of the hall are iron, the foundation of the drill hall floor is of concrete, the roof-covering is of metal, for the hall, and tar and gravel for the adjunct.

Clerk of works, Emile Tanguay, architect.

Contractors, Jos. Bourque & Cie.

## VALLEYFIELD.

## PUBLIC BUILDING.

This building which was described in my last annual report is nearing completion. It is being fitted up and furnished and having hot water heating and electric lighting installed.

Plans, &c., prepared by this department.

Clerk of works, Edmond Lemay.

Contractor, Théodore Bélanger.

## PROVINCE OF ONTARIO.

## ALEXANDRIA.

## POST OFFICE BUILDING.

This building which was described in my report for 1904 has been completed and is being fitted up, furnished and supplied with a hot water heating apparatus.

Plans, &c., prepared by this department.

Clerk of works, John R. Chisholm.

Contractor for construction of building, Jos. Bourque.

Contractor for post office fittings, W. C. Room.

Contractor for heating system, Martel & Langelier.

## BOWMANVILLE.

## PUBLIC BUILDING.

This building which was described in my annual report 1903-04 is completed, fitted, furnished and occupied. A hot water heating apparatus and electric lighting system are installed.

Plans, &c., prepared by this department.

Clerk of work, Ferdinand B. Whiting.

Contractor, Wm. Stuart.

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## BRANTFORD.

## DRILL HALL.

The additions to this building which were described in my report for 1903-04, are progressing and are expected to be completed early in the coming year. Plans are prepared for a hot water heating system.

Plans, &c., prepared by this department.

Clerk of works, L. H. Taylor, architect.

Contractors, Schultze Bros. Co.

## POST OFFICE.

Alteration of the external faces of the building and additions to and alterations of the internal fittings were made under the supervision of L. H. Taylor, architect.

## BRIDGEBURG.

## POST OFFICE.

On October 3, 1904, a contract was entered into for the construction of this building. It is of brick, two and a half stories on a stone basement, the basement portion lined with brick. The building measures 55 x 45 feet, and is bisected by a staircase hall, the brick partition walls of which reach from foundation to roof. In the basement are the furnace and fuel-rooms, lavatory, stairway hall and four other rooms; on the ground floor are the post office, the express office, three other offices and a brick vault; on the first floor three rooms and the staircase hall, and in the attic the caretaker's apartments. The basement floor is of concrete, but the remaining floors, roofs and most of the partitions are wood. The roof covering is of steel shingles on the slopes and galvanized iron on deck.

Plans, &c., prepared by this department.

Clerk of works, Thos. H. Allen.

Contractors, Cutter & Vanderbury.

## BURFORD.

## ARMOURY.

A site was purchased having a frontage of 90 feet on King street by a depth of 150 feet, having for its easterly boundary the westerly boundary of William street, and, on September 19, a contract was entered into for the construction of the building thereon. It is a wooden building, veneered with brick, and on a stone foundation, having in front a three-story and basement portion 49 feet by 23 feet and in the rear a two-story portion 45 feet by 32 feet. The basement is for bowling alley, shooting gallery, heating furnace and fuel; the ground floor is for cavalry armoury, mobilization store-room, officers' room and sergeants' room; the first floor a lecture hall and two rooms connected therewith, and the third floor two small rooms for storage. The heating is by a hot water system; the lighting is by acetylene.

Clerk of works, L. H. Taylor, architect.

Contractors for construction of building, fittings and heating, Nagle & Mills.

Contractor for lighting, D. C. Wallace.

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## CHATHAM.

## DRILL HALL.

A contract for the construction of this building which is to face on Colborne street, between Wellington street and Macgregor's creek, was entered into on January 30, 1905.

The building is to have a frontage of 160 feet by a depth of 111 feet, exclusive of the projection of two circular angle bastions, and consists of a one-story drill hall 73 feet in breadth by the full length of the building, and a two and three stories basement portion, 28 feet in breadth, exclusive of projections, by the full length of the building. The three story portions consist of the medium, 45 feet of the length and two circular bastions, one at each end, 14 feet in diameter. The basement of the two and three stories portions contains a men's recreation room, two furnace rooms, two fuel rooms, two store-rooms, a lavatory room and a stairway hall; on the ground floor are seven armouries, a C. O. room, a Q.M. store, a lavatory and W.C. room, a stairway hall and the main entrance to the drill hall. On the first floor are the officers' mess, lecture room, ante-room, &c., &c., and on the third floor the caretaker's quarters. The walls are brick with stone dressings and on a stone basement, the partitions are mainly brick as is the lining of the basement. The main hall is floored with wood blocks on concrete foundation and roofed with wood on iron principals, the whole covered with steel shingles. The two and three-story portion of the building has wooden floors, except in basement, and also a wooden roof covered with tar and gravel.

Plans, &c., prepared by this department.

Clerk of works, T. J. Rutley & Sons, architects.

Contractors, J. Pigott & Sons.

## COBOURG.

## ARMOURY AND GUN SHED.

This building which was described in my report for 1904, is now completed, and is being fitted up with a hot water heating system, armoury and other fittings, furniture, &c.

Plans, &c., prepared by this department.

Resident architect, C. Carruthers.

Contractor, David S. Booth.

## HAWKESBURY.

## POST OFFICE.

A contract for the construction of this building was entered into on January 18, 1905.

This is to be a two and one-half story brick building with stone dressings and on a stone basement, measuring 39 feet in frontage by 29 feet 6 inches in depth, and having a one-story brick adjunct in the rear, 24 feet in depth by 15 feet in breadth and on a stone foundation. The basement is for the heating apparatus, fuel and storage; the ground floor of the main portion to be the post office, stairway hall, W.C. and three brick porches, and the adjunct is to be the examining warehouse; the first floor is to be the customs offices, and the attic the caretaker's apartments. The basement floor is to be of concrete, but the remaining floors as well as the roof and partitions are to be of wood. The sloping roof is to be covered with steel shingles and the deck roof with tar and gravel.

Plans, &c., prepared by this department.

Clerk of works, Hilaire Maranda.

Contractor, Robert Cameron.

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## KINGSTON.

## CUSTOM HOUSE.

A desk was supplied the appraiser's office and a clock in the long-room. Repairs were effected to heating, plumbing, glazing, gasfitting, shutters and fences, under the supervision of Arthur Ellis, architect, Kingston, Ont.

## POST OFFICE.

The delivery wicket boxes and the street delivery boxes were painted and varnished. A clock was supplied to money order office, the flag halyards were renewed, repairs and additions were made to some of the fittings and repairs were effected to glazing, plumbing, heating, lighting, letter-boxes, shelving, water supply service, street boxes and fittings of post office generally. All done under the supervision of Arthur Ellis, architect, Kingston, Ont.

## STABLE FOR BATTERY 'B' R. C. ARTILLERY.

A contract for the construction of this building was entered into on April 8, 1905. It is of wood on a foundation of cedar posts, the roof covered with metal and the chimneys built of brick. There is a main portion 53 feet by 48 feet and two lateral portions each 66 feet by 32 feet. The main portion has a ground floor, containing four harness rooms, two feed rooms and a large entrance hall with an undivided loft above; each wing is divided longitudinally by a passage the entire length, having twelve stalls on either side and there is a low loft above. There are drainage and water service.

Plans and specification prepared by this department.

Resident architect and clerk of works, Arthur Ellis.

Contractor, David Booth.

## STABLES FOR ROYAL MILITARY COLLEGE.

A contract for the construction of this building was entered into on May 9, 1905. It is a brick building on stone foundations, two stories in height, 98 feet by 38 feet, exclusive of a projection of 2 feet by 30 feet in the middle of rear wall. In the middle 30 feet of the ground floor there are a feed room and a harness room divided by a 12-foot passage which runs from end to end of the building, while the remainder of the ground floor, on both sides of the passage, is divided into stalls and loose boxes; the upper flat is an undivided loft. The walls and chimneys are brick on a stone foundation; the ground floor is laid in concrete and the upper floor and roof is of wood with metal covering. There are drainage and water supply, iron stable fittings, &c.

Plans and specification prepared by this department.

Resident architect and clerk of works, Arthur Ellis.

Contractor, H. W. Watts.

## OSHAWA.

## POST OFFICE.

On September 2, 1904, a contract was entered into for the construction of this building, on the corner of Wellington and King streets.

It is a two and one-half story brick building, with stone dressings, and a stone foundation, consisting of a main portion 54 feet 6 inches by 37 feet 6 inches, a tower 15 feet square, which is three and a half stories in height, and a one-story and base-



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ment adjunct in rear 21 feet 6 inches by 25 feet. The basement floor is of concrete, but the remaining floors, the roof, stairway and partitions are of wood. The sloping roofs are covered with metallic shingles and the deck roofs with tar and gravel. In the basement are heating, fuel and storage rooms; in the main portion of the ground floor are the post office and also a brick vault, two vestibules and a stairway hall, and in the adjunct the examining warehouse and lavatories. On the first floor are five rooms and also a lavatory, a stairway and a passage, and in the attic, are six rooms and also a bath-room, a stairway and a passage.

Plans, &c., prepared by this department.

Clerk of works, Wm. Holland.

Contractor, W. J. Trick.

## OTTAWA.

## DOMINION ARCHIVES BUILDING.

On September 28, 1904, a contract for the construction of this building on the government property, Nepean Point, was entered into and the work is still in progress. It is to have three stories and basement and measures 100 feet in length by 50 feet in breadth. The walls of the basement are limestone and of the remaining portions Nepean sandstone with limestone dressings. The floors and roof are to be of iron and concrete and the constructive materials throughout mainly non-combustible.

The building is to be divided midway of the length by a hallway 15 feet wide, the rear end of which, from bottom to top contains a stairway, encasing an elevator, the front portion which is a storeroom in the basement, becomes a vestibule on the ground floor and an office on each of the succeeding floors. In the basement the remaining space will be divided into a binding room, a sorting room, a receiving room, an office, a lavatory, three rooms for the caretaker, a furnace room and a fuel room. To the right of the entrance on the three succeeding floors, the space is undivided excepting on the first floor where a portion of the space, 12 feet by 18 feet, is partitioned off as a storing room. To the left of the entrance, on the ground floor, there are five rooms and a passage, but the corresponding space on each of the succeeding floors is undivided.

Plans and specifications prepared by Band, Burritt, Meredith and Ewart, architects.

Clerk of works, Pat. Canty.

Contractor, W. H. MacGillivray.

## CENTRAL EXPERIMENTAL FARM.

Three of the residences were hung with electric bells and the grate of the director's residence was relined.

Work done under the supervision of this department.

## CENSUS OFFICES, O'CONNOR AND SPARKS STS.

This is a rented building. Twenty-six additional electric lights were installed.

## CORY BUILDING, RIDEAU STREET AND SAPPERS BRIDGE.

This is a rented building. Forty-nine additional electric lights were installed.

## EASTERN BLOCK—DEPARTMENTAL BUILDING.

The Privy Council Chamber was cleaned and painted and had the furniture repaired. Of rooms cleaned and tinted there were five in the Finance Department, five rooms in the Indian Department, one room in the Auditor General's Department, two

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rooms in Secretary of State Department, and one room in the Privy Council. There was a new ceiling put in long room of Indian Department, and a new floor laid in one of the rooms of Privy Council Department. There were thirty-four articles of furniture made and supplied and twenty-six articles repaired. There were fourteen brass rods and curtains and three chair cushions supplied. There were sixty-one signs written, ninety-seven lights glazed, sixty articles of furniture, &c., renovated, and a quantity of shelving furnished and painted. Steel file cabinets and files were supplied to the Secretary of State, Justice and Indian Departments. Repairs were made to air ducts, drains and cement floor and alteration of water main was effected. A new wash basin was fitted up in each of rooms, Nos. 42, 47, 54 and 63. Electric bell connection was made for rooms 58, 62 and the treasury vaults. Telephone wiring was hung for rooms 105, 107 and 109. Steam pipe connections were made to a room in basement and a heating coil placed in the Privy Council corridor. There were supplied and connected seven portable lights, twenty-one drop lights, two meridian lamps, and three 6-light pendants.

There were minor jobs such as lettering, painting, &c., and joinery. The double windows and summer blinds were taken off, stored, cleaned and put on periodically, and the roofs, footpaths and roads kept free from snow during winter.

Work done under the supervision of this department.

Superintendent, John Shearer, jr.

#### GEOLOGICAL MUSEUM.

Repairs were made to drain, three cupboards were made and supplied, some articles of furniture were renovated, some lights were reglazed, a gas-stove was supplied and connected in the caretaker's quarters and a gas stand as well as a number of mantles furnished.

Work done under the supervision of this department.

Superintendent, Jno. Shearer, jr.

#### GOVERNMENT GROUNDS.

On the Lovers' Walk a lavatory building for ladies and gentlemen was built of concrete, fitted up with water closets and lavatory basins—marble divisions, tinted walls, &c. The old tool-house north of the Queen's statue was removed and replaced by one of concrete, the roof of which forms a look-out. The look-out platform at the lion's head drinking fountain, was enlarged and railed with iron. The esplanade in front of the Parliament Houses was paved with Warren's bitulithic, and a part of the lawn near the summer-house graded and sodded to form a bowling green for the use of the members of the House of Commons. The service pipes for watering the lawns at the parliament grounds was extended. A new drinking fountain was placed in Major's Hill Park and an ornamental fountain in the lake there. At the Major's Hill park, new seats were provided; a large quantity of earth was used in grading, a large quantity of sods for lawns, trees, shrubs and herbacées plants were purchased and planted, as also a large quantity of native ferns and wild flowering plants. Some new species were acquired for the plant-house and green-houses.

Work done under the supervision of this department.

#### GOVERNMENT HOUSE.

A building 80 feet by 42 feet was built on the lawn for a supper and lounging room for the state ball, and was connected with the house by covered passageways. Further measures to render the attic fireproof were carried out. A steel beam to support billiard-room floor joists was put in and a new hardwood floor laid. The walls of ice-house were renewed. Additions to shelter building at skating rink were

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made which doubled the previous capacity and the entire building was painted, repaired, fitted up with extra lights, &c. Two of the chimney shafts were taken down and rebuilt in fire-brick, the stonework of south front was repointed, the cement floor of boiler-house was raised and the terrace stairs at end of tennis court renewed. The house drains were overhauled and put in good order. A new water service was put in from street through cricket ground, hydrant, cocks and hose fitted up. The 2-inch water pipe to lodge was taken up and replaced by new and the gas main was repaired. The unfinished portions of basement and first floor ceiling were plastered, the electric bell wiring thereat put in and the light wiring renewed. There were 785 lights reglazed, 2,375 yards two and three coat painting at the house and 3,497 yards in out-buildings and fences; cleaning and tinting at the house, 1,750 yards and papering 750 rolls; at the laundry and stables, 1,046 yards and 56 rolls respectively; shellacing at the house, 512 yards and bronzing 37 heating coils. A new water closet was built at coach-house; two new steel ranges were installed in scullery and still rooms, a new billiard table was set up in billiard room with a 6-light pendant over, and some chopping boards and waiter trays made for kitchen and pantry. Repairs were made to dairying machines, stable fittings, coal and wood-shed, fences and gates, bed and plant tables in green-houses, hot-bed sash, garden rollers, wheelbarrows and boat-houses were repaired, and the kitchen coppers were retinned and repaired. There was supplied one Steinway grand piano, four toilet sets, a table, a desk, a plate warming cabinet, large quantities of china, glass, crockery, cutlery, linen and carpets, as well as a large number of kitchen, still-room and house-maid's, butler's and steward's utensils. A quantity of furniture, furnishings, plate and bric-a-brac was acquired from Lord Minto at the close of his term of office. The grounds were supplied with fruit trees, shrubs, plants, fertilizers, insecticides, implements, tools, &c., &c. Four hundred and seven lineal feet of sidewalk and crossing, and 380 lineal feet of close board fence were renewed, and 3,120 lineal feet of fence, together with four new gates constructed.

The conservatories were kept in order, the lawns, drives, &c., rolled and otherwise tended. The ice-house was stored with ice. The roofs, paths, slides, rinks, &c., were cleared of snow by the departmental staff, by whom the grounds, lawns, gardens and plant-houses were maintained.

The usual periodic cleaning, packing and unpacking were done; arrangements for and attendance on entertainments were furnished, and the rinks, slides, &c., kept in order.

## RIDEAU COTTAGE.

The building was repaired and overhauled before being occupied by the Military Secretary. New floors were laid in five-rooms, as also in passages, kitchens and pantry, in basement. The ceilings and walls were cleaned and tinted and thirteen rooms repapered. New water closets were fitted up to replace the original which were removed and electric bells were installed in lieu of the old pull-bells. The electric wiring was overhauled and in part renewed and new fixtures, &c., installed throughout. The dumbwaiter was rebuilt and new sinks and bath fitted up. Picture moulding was put up in six rooms, and cupboards were made for bed-rooms.

Work done under the superintendence of Wm. Hutchison, clerk of works.

## GOVERNMENT WORKSHOPS—O'CONNOR AND QUEEN STREETS.

This building which was acquired by purchase, has been altered, the part facing on O'Connor street by the depth on Queen street has been remodeled and rearranged for use as an office building, and furnished with a hot water heating apparatus. The rear portion has been fitted up for workshop purposes. Eight water closets, ten wash basins,

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drainage and water supply pipes were fitted, and above 200 electric lights installed.

Work done under the supervision of the department.

Jno. Shearer, jr., superintendent.

#### IMPERIAL BUILDING.

This is a rented building on the south side of Queen street, near O'Connor street. A system of electric bells was installed for the offices and a ventilation fan in the water closet. Thirty-four additional electric lights were installed and some of the original lights altered.

Work done under the supervision of this department.

Superintendent, Jno. Shearer, jr.

#### LABOUR DEPARTMENT.

This is a suite of rented offices, situated on Metcalfe street, opposite the Langevin block.

Five additional electric desk lights were installed.

#### LANGEVIN BLOCK.

The money order branch of the post office had the long room fitted throughout with steel file cabinets, in the Agriculture Department, the Patent Branch had a like equipment and in the Interior Department nine separate cases were placed. Six rooms were cleaned and painted, thirty-two lights of glass were renewed and twenty-two signs written. Fifty-four articles of furniture, six brass rods and curtains and twenty-nine chair cushions were supplied; sixty-six articles of furniture were repaired and ten articles of furniture painted or varnished. Electric bells were hung in six rooms; one new sink and one new wash basin were fitted up. There were installed eight meridian lamps, ten portable lamps, twenty-five drop lights and a number of shades.

Work done under the supervision of this department.

John Shearer, jr., superintendent.

#### BRANCH OF ROYAL MINT.

A contract for the erection of this building was entered into January 5, 1905.

It is situated at the intersection of Sussex and Cathcart streets having the Ottawa river in the rear. Excepting for some minor projections of the front, this building is a rectangular parallelogram 224 feet from north to south by 164 feet from east to west. The main block occupies the south frontage by a depth of 45 feet, excepting in the middle where a portion, 45 feet broad projects 14 feet to the front and 21 feet to the rear; this main portion has two stories and basement with an additional story on the middle portion. In the basement of this block are to be the furnace and fuel rooms and stores; on the ground floor are mint office, furnace room, stronghold, bronze store and offices of chief clerk, assayer and assistant assayer; on the first floor the laboratory, deputy master's staff and quarters, and on the second floor a large room for clerks. To the north of this block is a courtyard 70 feet by 90 feet, north, east and west of which are the remaining buildings, all of which are but one story and which together with the main building inclose the courtyard excepting an entrance 12 feet in width at the eastern side behind the main building. On the western side, commencing at the main building, there are weighing room, plan room, washing and pickling, kitchen, bath, store, W.C., kitchen, bath and W.C.; on the eastern side from the yard entrance northward are stronghold, melting house office, melting house, grinding room, kitchen, w.c., bath, gas plant and die room; all these, both sides, have no basement. The middle 100 feet in length of the north side is devoted to boiler-house and fuel rooms in the base-

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ment, the boiler house being carried up through the ground floor, and to engine, dynamo and mechanics rooms on the ground floor. To the southward of the boiler room, is a stronghold and beyond this the rolling and cutting room with the superintendent's room attached. The basement walls are granite and the walls above of Nepean sandstone with granite dressings. The construction is fireproof.

Plans, &c., prepared by this department.

Clerk of works, Geo. Stockand.

Contractors, Sullivan & Langdon.

## ROYAL OBSERVATORY, TRANSIT HOUSE.

A contract was entered into on May 16, 1904, for the construction of an addition to the western portion of the observatory consisting of a ground floor and basement on the same level as the corresponding floors of the present building and roof on the same level as that of the present building. There are first, one room, 20 feet square inside and another, 33 feet by 15 feet inside. The walls are stone, similar in construction to those of the present building but lined with brick, and having an inner wall of sheet-iron separated from the outer wall by a narrow space. The roof and the ground floor are concrete and iron and the basement floor concrete. The walls and roof are provided with shutter openings extending from 3½ feet above ground floor level to and over the roof from side to side. The walls are provided with openings, louvred in slate, to allow a free circulation of air. For the support of the instruments a number of concrete piers are to be constructed, resting on the basement floor and extending up through and above ground floor.

Plans, &c., prepared by this department.

Clerk of works, P. Canty.

Contractors, McGillivray & Labelle.

## PARLIAMENT BUILDINGS.

New skylights were erected over the Senate Chamber, passages and stairway, and four of the House of Commons skylights were repaired. A new lavatory and water closet was fitted up for the Senate on the ground floor and alterations were effected in the House of Commons lavatories. The Senate Chamber galleries were overhauled and cleaned, the floors covered with linoleum and some new seats provided. A water closet and lavatory was fitted up for the parliament library and a new lavatory basin each for the Speaker of the Senate and the Accountant of the House of Commons. A 12-inch electric fan was supplied to the Librarian's office. Portable desk lamps were supplied, one to the Librarian's office, one each to rooms 29, 41, 43, 59, 69 and 67. Electroliers were intalled, three light pendants, one each in Assistant Clerk of votes' office, and rooms 25 and 51; a 5-light pendant and a 4-light ceiling cluster in room 38; 2-light pendants, one each in Law Clerk's office and new room in House of Commons attic. Four drop lights were installed, one in room 68, two in room 58, four in room 56, two in room 10 and one in the tower-room. A moving electric fixture was installed in room L. A division bell was hung in room 66, two heating radiators in bath-rooms, extra steam heating coils in room 30, and an extra ventilation pipe in the restaurant kitchen.

Repairs were made to brickwork of ranges, concrete steps, ice-box, &c., In the House of Commons, 9 rooms were cleaned, painted, &c., as also corridors; twenty-three lights of glass were supplied, six signs painted, eighteen articles of furniture renovated. In the Senate, the Speaker's quarters and the Housekeeper's quarters were cleaned and painted and nine articles of furniture renovated. Generally seventeen articles of furniture were made as well as four brass rods and curtains and some shelving, steel filing cases, &c.

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The carpets were taken up, cleaned and relaid, the double windows and summer blinds were taken off, stored, cleaned and put on periodically, and the roofs, roads and footpaths kept clear of snow during the winter.

Work done under the supervision of this department.  
Superintendent, J. Shearer, jr.

## CITY POST OFFICE.

Plans and specification were prepared for the additional story and the restoration of the attic and cockloft referred to in my report of last year and the work is in progress and is expected to be completed early in the next fiscal year. The cockloft is to be finished as rooms, for storage and other purposes, and an elevator is being put in with a travel from basement floor to cockloft. The ground floor is to have hot water heating served by the furnaces in the sub-basement, while the upper floors are to be heated by steam served by the boiler in basement.

Plans and specification prepared and work supervised by this department.  
Clerk of works, Samuel Adams.

## PRINTING BUREAU.

On January 13, 1904, a contract was entered into for a one-story addition, 50 feet in length by 53 feet in breadth to the north of the west wing. The walls are to be brick on a stone foundation, the ceiling of brick and iron and the floor cement concrete. There is a single row of columns lining with those of the press-room and supporting the ceiling. Above the ceiling is a tar and gravel roof covering.

On July 6, 1904, a contract was entered into for three additional stories on the foregoing; on May 5, 1905, a contract was entered into for the removal of the roof of the entire original building and the construction of a full story in brick, roofed in concrete and steel covered with tar and gravel and, on July 5, 1905, a further contract was entered into for another additional story on the entire building inclusive of the addition.

Plans, &c., prepared by this department.  
Clerk of works, P. Canty.  
Contractors, Wm. Doran and R. M. Devlin.

## PRINTING BUREAU—MINOR REPAIRS.

A new sink and an electric buzzer were placed and connected. A new tank was put in. A number of articles of furniture were supplied and a number repaired. Repairs and renewals were made to woodwork, glazing, painting, plumbing, &c., requiring a number of workmen, the plumbing and steam fitting repairs requiring a man and helper constantly.

Work done under the supervision of the department.  
Superintendent, Jno. Shearer, jr.

## REPAIRING STREETS, &amp;c.

The pavement of yard at Geological Museum was repaired and partly renovated; the sidewalks on bridges were repaired and partly renovated; Wellington street was in part remetalled; scraping, cleaning and general repairs were done to the various road ways, footpaths and streets under the control of the department. Rubbish, scrapings and ashes were removed from the east block, west block, Langevin block, parliament building, the workshops, printing bureau, the museum, the several rented buildings and the various streets, and deposited at Nepean Point; the grass at Printing Bureau, about Cartier Square, Wellington street, two bridges, Survey Office, Fisheries Museum and



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Geological Museum was kept clipped, manure was drawn on and removed therefrom, and the ashes removed from the boiler houses and furnace rooms of the various buildings: waste paper was removed periodically from all the buildings; the roadways, sidewalks, footpaths, roofs and yards kept clean of snow during the winter.

Work done by the departmental staff.

## SUPREME AND EXCHEQUER COURTS.

Three additional electric lights were installed.

Work done under the supervision of this department.

Clerk of works, F. Breton.

## VICTORIA MEMORIAL MUSEUM.

A contract was entered into on December 28, 1904, for the construction of this building which is to be erected on a plot of ground bounded by McLeod, O'Connor, Argyle and Elgin streets, situated about one mile south of the parliament building and across the southern end of Metcalfe street, the northern end of which is faced by the parliament building.

The building is designed to consist of a main curtain 219 feet long by 53 feet deep, having a wing at either end 54 feet by 143 feet 6 inches, a tower 58 feet square in front of the middle and an amphitheatre 81 feet broad by 76 feet deep, in the rear, giving a total length of 392 feet frontage by a total depth of 187 feet. The building is four stories, basement and sub-basement, excepting the tower which has an additional story. The general height from ground line to top of parapet is 106 feet, from ground line to top of tower parapet 220 feet, and from basement floor to attic ceiling 103 feet. The walls are to be of stone, the partitions brick and the floors, roof, &c., mainly of iron, terra cotta and other non-combustible materials.

The eastern wing from basement to attic is to be occupied by the fisheries museum and the art gallery; the amphitheatre by the furnace room in basement, the lecture hall and gallery above and the geological survey library at the top. Exclusive of the tower, main hall and amphitheatre, the building is to be divided as follows:—The basement, second and third floors into offices and the ground and first floors each into four large museum rooms.

Plans and specifications prepared by this department.

Clerk of works, P. Canty.

Contractor, George Goodwin.

## WESTERN BLOCK.

A new elevator with a travel from basement to attic was installed in the well of the main stairway on the southern frontage and an entrance to the basement opened at the eastern side of the entrance steps to ground floor.

Rooms were cleaned and tinted, three for the Marine Department, fifteen for the Public Works Department, eight for the Railways and Canals Department. Steel filing cases were supplied, two to the Mounted Police, one to the Railways and Canals and two to the Marine Department; also the correspondence branches of the Customs and Inland Revenue Departments were fitted up with steel cases, the latter having a gallery. Ninety-six articles of furniture were made for the various departments; thirty-seven articles of furniture were repaired; nine chair cushions were supplied; six new floors were laid; eight brass rods and curtains were supplied; 130 signs painted and written; 105 articles of furniture renovated; 103 lights glazed and a quantity of shelving, coat hooks, &c., &c., supplied. Repairs were made to cement flooring, plaster, stonework and tinsmithing. The steam heating apparatus was altered to allow of the installation of a Webster vacuum plant of pumps and receiver and the Webster valves were

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attached to all the coils and radiators. New coils or radiators were placed, two in the Public Works Department, three in Railways and Canals Department and two in Inland Revenue Department. A telephone line was run from the Public Works Department to the ship-yard and a ten stations automatic switch telephone was installed between the office of the Honourable the Minister and those of the chief officers of the various branches. The new cement laboratory was fitted up with plumbing and steam fitting. Electric bells were hung and indicators furnished for Trades and Commerce and Public Works. Portable desk lamps were supplied, fifteen in Public Works Department, fifteen in Marine and Fisheries Department, seven in Customs Department, two in Justice Department, three in Trade and Commerce Department and one in Railways and Canals. Drop lights were placed, seven in the Public Works Department, twelve in the Railways and Canals, six in the Inland Revenue Department, seven in the Trade and Commerce Department, twenty-two in the Marine and Fisheries Department and twenty-seven in the Customs Department. Electroliers were fixed in the Public Works Department, one of four lights and five of three lights, in the Marine and Fisheries Department, one of four lights and in the Customs Department one of three lights. One bracket was fixed in the Marine and Fisheries Department and one in the Customs Department. One electric heater was supplied the Public Works Department and one electric fan to the Marine and Fisheries. A new lavatory basin was placed in 184 and an electric heater in room 50.

There were also a large number of minor jobs of painting, lettering and of joinery. The roofs, roads and footpaths were kept free from snow. The winter sashes and summer blinds were cleaned, put on, taken off and stored periodically.

Work done under the supervision of this department.

Superintendent, J. Shearer, jr.

#### ADDITION TO THE WESTERN BLOCK INCLUDING ALTERATION OF RECORD WING OF EXTENSION.

A contract was entered into on April 10, 1905, for an addition to this building to extend from the eastern end of the records wing of extension eastward to the northern end of the east wing of the original building, which it will abut and overlap, and further, for the removal of the roof and galleries of the aforesaid wing, the addition of a story thereto similar to the attic story of the extension, alteration of window openings, &c., therein, and the removal of the east end wall of the same. The addition (83 x 36 feet), is to be similar in breadth to the records wing, excepting that on the north side at the east end of the addition, where it will abut and overlay the original building, there is to be a tower 25 feet square projecting 3 feet from the face of the north wall, and that there is to be a projection from the south wall 10 feet by 20 feet in breadth for a stairway. The addition is to continue the lines of the extension throughout all the stories, excepting in the tower, which is to be similar in all respects to the tower on the south front of the original building. The materials are generally similar to those used in the extension, but the roof is built of concrete and iron.

Plans, &c., prepared and work supervised by this department.

Contractor, George Goodwin.

#### WOOD'S BUILDING, QUEEN STREET.

This is a rented building occupied by the Customs Department, the Board of Railway Commissioners and a branch of the city post office. An additional electric bell, an electric fan and twenty additional electric lights were installed.

Work done under the supervision of this department.

Superintendent, Jno. Shearer, jr.



## SESSIONAL PAPER No. 19

## OTTAWA.

## BUILDINGS AND GROUNDS GENERALLY.

In addition to the works mentioned in the foregoing there are innumerable smaller works, *i.e.*, there are items of repair done by the roofers, the masons, plumbers and other trades; items taking each a number of days work of a tradesman besides material to accomplish. Besides all these, in connection with the various other buildings, the property of the government, there are similar works of repair, painting, furnishing, tinting, &c., in connection with a number of rented buildings; also such works as repairs to and renewals of coal and other sheds as well as works of a general character, such as the erection and taking down and storing of porches, winter boarding outside steps, &c., &c., all of which are done by the departmental staff.

## SAULT STE. MARIE.

## PUBLIC BUILDING.

A contract was entered into on November 23, 1903 for the construction of this building, which is situated on the corner of Queen and East streets, with frontage of 71 feet 6 inches and 119 feet 6 inches respectively. It consists of a main portion, 71 feet 6 inches by 56 feet of three stories, including an engaged tower 16 feet square extending one story above attic, and a wing 63 feet 6 inches by 41 feet 4 inches in the rear, all of which, excepting a portion adjoining main building and which is devoted to stairway halls, W.C.'s, bath-rooms, vaults and entrances, is but two stories and basement. The basement and ground floor external walls are of stone, lined with brick, and those of the remaining stories, brick with stone dressings—the partitions are in part brick and the remainder wood—the beams and columns throughout are iron and the joists, floors (except that of basement) and roof of wood, the flat roof covered with tar and gravel. The basement, excepting a portion of wing, is excavated and floored with concrete; it is to contain heating apparatus, fuel, elevator machinery, &c. The ground floor, main portion, is for the post office and the wing for the examining warehouse, Gas Inspector, weights and measures, lavatories, P.O. vault, mail entrance, vestibule and main stairway. On the first floor are to be the customs and inland revenue long-rooms, the offices of the Collectors of customs and inland revenue and Fishery Inspector, an armoury, a lavatory, a stairway hall and two brick vaults. On the second floor are the apartments of the caretaker. Centrally situated on the roof of the main portion, 25 feet by 16 feet is a skylight covering a light shaft of same dimensions extending down to the ground floor ceiling.

Plans, &c., prepared by this department.

Clerk of works, James Thomson, architect.

Contractors, MacPhail, Maccarty & Wright.

## ST. CATHARINES.

## DRILL HALL.

This building which was described in my report for 1904, is still in progress. Plans for a hot water heating apparatus and for armouries' fittings have been prepared.

Plans, &c., prepared by this department.

Resident architect and clerk of works, G. Dolson.

Contractors, Messrs. Sullivan & Langdon.

## SANDWICH.

## POST OFFICE.

On June 12, 1905, a contract was entered into for the construction of this building which is to be two and a half story brick with stone dressings on a stone base-

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ment, measuring on plan 38 feet frontage by 29 feet depth. It is to contain on the ground floor the post office, W.C. and stairway hall; on the first floor four rooms, passage and stairway; in the attic three rooms, bath, W.C. and passage, and in the basement heating apparatus and fuel. The floors, excepting that of the basement, which is to be concrete, together with the partitions and roof, are to be wood, the last named covered with metal shingles on the slopes and tar and gravel on the deck.

Plans, &c., prepared by this department.

Clerk of works, John Maclean.

Contractor, Geo. Alfred Proctor.

## STRATFORD.

### ARMOURIES.

A contract for the erection of this building was entered into on November 25, 1904, and the work is in progress.

The building is of brick with stone dressings, on a stone basement, and measures 130 feet by 60 feet, exclusive of two circular bastions which occupy the angles of one side of the building. The building contains in the basement floor a shooting gallery, a bowling alley, boiler and fuel rooms, lavatory and stairway hall; on the ground floor two officers' rooms, C.O. room, orderly room, officers' lecture room, Q.M. room, band room, eight armouries, two ante-rooms, lavatory, stairway hall entrance and passage; on the first floor a lecture room 105 feet in length by the width between the outside walls, stairway hall, sergeants' mess and caretaker's apartments, and on the second floor, which is but 25 feet in depth by the breadth of the building, a store-room and caretaker's apartments.

The partitions are in part brick and the remainder iron and plaster. Excepting the basement floor, which is concrete, all the floors and roof are of wood, excepting that the roof is trussed with iron.

Plans, &c., prepared and work supervised by H. C. Macbride, architect, London. Contractors, Nagle & Mills.

## TORONTO.

### GENERAL POST OFFICE.

Extensive improvements were made in the electric wiring; new fittings were installed in the dead-letter office; alterations of the drains were effected and the street letter boxes were painted. All under the supervision of S. G. Curry, architect, Toronto.

The lath and plaster ceiling of the basement was removed and the joists and underside of floor boards together with all the basement walls from Lombard street to Adelaide street were whitewashed two coats. The basement lavatory and dining-room and the outside lavatory as well were painted. Whitewashing, painting, minor repairs, plumbing, steamfitting and other routine work carried out, by the mechanical staff, under the supervision of H. E. Hamilton, engineer, public buildings, Toronto, Ont.

### EXAMINING WAREHOUSE.

The hardware department was altered to give suitable accommodation for the gauges, removed from the custom house and a new hardware department was fitted up on the second floor of the Yonge street front. The second floor was fitted up with steam heating and electric lighting.

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A four-story addition was constructed for the use of the Dominion Express Company.

Work supervised by S. G. Curry, architect, Toronto, Ont.

The boiler-room, engine-room and belt-room were whitewashed and painted. The walls of the express-room were whitewashed and the ceiling tinted, as also the flat formerly occupied by the Dominion Express. These works as well as repairs to heating, plumbing, gasfitting, &c., window cleaning, removal of snow and other routine work was done by the mechanical staff, under the supervision of H. E. Hamilton, engineer, public buildings, Toronto, Ont.

## POSTAL STATION 'C.'

A portion of the first floor was divided by partitions to form apartments for the caretaker and fitted up with plumbing, &c. A hot water heating apparatus is to be fitted up.

Work supervised by S. G. Curry, architect, Toronto, Ont.

## CUSTOM HOUSE.

Repairs and renewals of steamfitting, plumbing, whitewashing, window cleaning, snow removal, double window attendance and routine work generally done by the mechanical staff, under the supervision of H. E. Hamilton, engineer, public buildings, Toronto, Ont.

## TORONTO JUNCTION.

## PUBLIC BUILDING.

This building, which was described in a previous report, is fitted up, furnished with a hot water heating apparatus and with electric lighting.

Plans, &c., prepared by this department.

Clerk of works, John Patterson.

Contractors for construction, Joy Needham.

Contractors for fittings, T. P. Wright & Sons.

Contractors for heating, Martel & Langelier.

## WINGHAM.

## POST OFFICE.

This building which was described in my report for 1904, is still in progress.

Plans, &c., prepared by this department.

Clerk of works, Wm. Nicholson.

Contractor, S. S. Cooper.

## WOODSTOCK.

## ARMOURIES.

On November 25, 1904, a contract was entered into for the construction of this building.

The building is of brick on a stone basement and measures 140 feet by 60 feet exclusive of the circular and octagonal angle bastions.

The basement which is floored with concrete and lined and partitioned with brick, contains bowling alley, shooting gallery, boiler room, fuel room, stairway hall and lavatories; on the ground floor are a stairway hall, two officers rooms, a C.O. room, eight

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armouries, band room, Q.M. room, two ante-rooms and lavatory; on the first floor is a lecture hall, 115 feet in length by the full width between the outside walls, also a paymaster's room, sergeants mess, lavatory and two rooms for caretaker; the second floor is limited to a strip at end of building 25 feet in length by the breadth of the building and contains caretaker's apartments and sergeants stores. The partitions throughout are mainly either brick or iron and plaster; the floors and roof are of wood.

Plans, &c., prepared by H. G. Macbride, architect.

Clerk of works, Alex. White.

Contractors, Nagle & Mills.

## PROVINCE OF MANITOBA.

### DAUPHIN.

#### IMMIGRATION HALL.

A fence was constructed under the supervision of Jas. Greenfield, Superintendent of public buildings, Winnipeg, Man.

### EAST SELKIRK.

#### IMMIGRATION HALL.

The pump and windmill were repaired and a box stove supplied and put up under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

### VIRDEN.

#### ARMOURY.

On December 14, 1904, a contract was signed for the construction of this building which is of wood, two stories, on a stone basement, and measures on plan, 62 feet 10 inches by 31 feet 8 inches. The basement is floored with concrete and is to contain the fuel and the heating furnace; on the ground floor is to be the cavalry mobilization store, cleaning room, sergeants room, and a room 30 feet by 28 feet, and on the first floor, a cavalry armoury, 46 feet by 30 feet, a C.O., an orderly room and a stairway hall.

Plans, &c., prepared by this department.

Clerk of works, T. B. Mitchell.

Contractor, Wm. Henry Ireland.

### WINNIPEG.

#### MAGAZINE.

A contract for the construction of this building was entered into on December 14, 1904. It is a one story wooden building on a concrete foundation having a concrete floor covered with wood flooring. The walls and roof throughout are covered with copper. It measures 67 feet by 21 feet and is 14 feet from floor to ceiling.

Plans, &c., prepared by this department.

Contractors, J. & J. McDiarmid.

## SESSIONAL PAPER No. 19

## WINNIPEG.

## EXAMINING WAREHOUSE.

A stove, a letter box and a sign were supplied. Repairs were made to furnace, plumbing, woodwork and furniture under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## CUSTOM HOUSE.

A new system of plumbing was fitted up, one room tinted, pigeon-holes and window guards were furnished and repairs were made to boilers and plumbing.

Work supervised by Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## LANDS OFFICE.

Additional plumbing was fitted as well as plumbing repairs done, a pigeon-hole case and some grate bars were supplied and repairs done to woodwork, pipes, &c., under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## POST OFFICE.

The entire plumbing system was renovated and improved, the heating system was altered and added to and repairs were made to elevator, brickwork, glazing, woodwork, &c. The heating surface painted and the basement kalsomined.

Work supervised by Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## IMMIGRATION HALL.

Electric light was installed, the walls and ceilings were covered in part with metallic plates, plumbing was fitted up and beds, filters, furniture, range, &c., supplied under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## IMMIGRATION BUILDING.

The contract for the construction of this building was entered into on August 22, 1904.

It is being erected at the Canadian Pacific Railway station, measures 200 feet in length by 61 feet in breadth and consists of four stories and basement. The ground floor walls and basement walls are of stone, lined with brick and those of the remaining stories are of brick. A number of the partitions are of brick and the remainder of iron and plaster, the floor of basement is concrete, but the remaining floors and roof are of iron and concrete, the latter covered with copper. The building is divided into three sections; the middle has in the basement the fuel and furnace rooms, on the ground floor the commissariat and the first, second and third floors the dormitories; the right section has in the basement the baggage-room and on the remaining floors dormitories, while the left section has in the basement the laundry and lavatories, on the ground floor the offices for the Interior Department administrative staff, and in the remaining flats apartments for the caretakers. On each floor there are separate baths, lavatories and W.C.'s for the sexes.

Plans, &c., prepared by this department.

Contractors, Kelly & Mitchell.

Clerk of works, Jas. Chisholm.

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## WINNIPEG.

## NEW POST OFFICE.

On November 22, 1904, a contract was entered into for the construction of this building which is designed to be erected on Portage avenue, and which is the third building for a like purpose erected by the department since the year 1875. The first and second buildings were erected on the same site, on the corner of Main and Owen streets, the latter of which street was subsequently renamed Macdermott avenue; the first building was commenced during the fiscal year 1874-75, and completed during 1875-76, the second commenced during 1884-85 and completed during 1886-87.

The new building is to have 134 feet frontage, on Portage street, by 156 feet in depth; to be of four stories and basement, excepting a strip 39 feet in depth extending the full street frontage, which is to be six stories and basement.

There is to be a basement the full size of the building; the ground floor throughout is to be undivided and contain two treasury vaults, an elevator and stairways; the first and second floors are to be divided into passages and rooms; the third floor is undivided and the fourth and fifth which extend along the entire frontage but are 30 feet in depth are to be used as store-rooms and caretaker's rooms. The building is of brick on an iron and steel foundation, the entire front wall on Portage avenue is to be faced with stone, cut and carved. The constructive materials in the main are non-combustible.

Plans prepared and work supervised by Darling & Pearson, architects, Toronto, Ont.

Contractors, Kelley, Bros. Coy.

Clerk of works, Robert Wilson.

## WEIGHTS AND MEASURES OFFICE.

Repairs were made to plumbing and furniture, under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## POST OFFICE (TEMPORARY).

New parcel bunks were constructed, the trucks were lettered, some steel cabinets were supplied and furniture and electric bells repaired. Two desks and a chair were supplied the office of the Inspector of Railway Mail Service and the office of the P.O. Inspector, a pigeon-hole cabinet.

Work done under the supervision of Jas. Greenfield, superintendent of public buildings, Winnipeg, Man.

## NORTH-WEST TERRITORIES.

## MOOSEJAW.

## PUBLIC BUILDING.

On January 13, 1905, a contract was entered into for the construction of this building, two and a half stories of brick on a stone basement and with stone dressings, 58 feet by 36 feet, with a one story and basement adjunct, at end, 15 feet by 35 feet, on a site at the corner of Fairford and Main streets. The basement is for heating, fuel and stores, the ground floor main portion is for the post office and the adjunct for the examining warehouse; the first floor has the customs long room and three offices, and the attic the caretaker's quarters. There is to be a brick vault both on ground and first floors, and a lavatory room in the adjunct.

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The basement floor to be of concrete, but the remaining floors, as well as roof and partitions, are wood, the roof covered with steel shingles on slopes, and tar and gravel on deck. The basement walls are to be lined with brick.

Plans, &c., prepared by this department.

Contractor, Patrick Navin.

Clerk of works, Robert E. Doran.

## PRINCE ALBERT, SASK.

## PUBLIC BUILDING.

On January 21, 1905, a contract was entered into for the construction of this building which is to be two and a half stories and basement, situated on the corner of Church and Third streets with frontages thereon of 110 feet 6 inches and 116 feet respectively. The depth throughout is to be 43 feet from front excepting at the extreme end of the Third street wing where there is to be a one story adjunct in rear, 35 feet in depth by 33 feet broad. The foundations are to be concrete, the basement of stone, lined with brick, the remaining walls of brick with stone dressings. The basement and ground floor partitions and some of those of the first floor are to be of brick and the remainder of wood. The floor of the basement is to be of concrete and the remaining floors as well as the roofs are of wood, the roofs to be covered with steel shingles on the slopes, but tar and gravel on the deck. The lavatories are to have tiled floors and tiled dados.

The basement is to contain a boiler room, a guard room, a lock-up, six cells, a brick vault, three lavatory rooms, two stairway halls and six store rooms; on the ground floor is to be the post office, customs long room, Collector's office, examining warehouse, mail entrance hall, five rooms and two vaults for the Interior Department, a brick vault each for post office and customs, four stairway halls, four vestibules and one entrance hall; on the first floor are to be court room, offices for lawyers, witnesses, jury, sheriffs and clerks, library, three spare offices, three stairways, two lavatory rooms and passages; the attic on Church street is unfinished and the remainder is to be laid out as caretaker's quarters.

Plans, &c., prepared by this department.

Clerk of works, Wm. Knox.

Contractors, Chas. Lemoine & Co.

## RED DEER, ALBERTA.

## COURT HOUSE.

This building which was described in my report of 1904, has been completed and is being furnished with a hot water heating system.

Plans, &c., prepared by this department.

Clerk of works, Hugh Clarke.

Contractors for construction of building, Johnston & Tait.

Contractors for heating, Morrison & Johnston.

## PROVINCE OF BRITISH COLUMBIA.

## KAMLOOPS.

## PUBLIC BUILDING.

The electric lighting fixtures were supplied and put in position and a new heating radiator placed in hall.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

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## NANAIMO.

## PUBLIC BUILDING.

The addition to this building which was described in a previous report has been completed and a hot water heating system put in the entire building. The new portions were wired and the original building re-wired for electric light. A cement concrete sidewalk was laid along the entire front and the south end of original building; retaining walls of rubble masonry with cut stone coping were erected at northern and southern sides of property; the old stone wall was pointed in cement mortar and a concrete roadway was laid from examining warehouse to Main street. New lock boxes were supplied and fitted in post office; a door was changed to form a window and a window to form a door; the floor in post office was relaid; the vaults were shelved and furnished with fixtures, the street letter boxes and flag pole were painted; a partition was built around the ladies lavatory in basement; cast iron posts and wrought iron pipe fence was erected; a ventilator was made in skylight over long room of custom house, the windows at entrance were lettered and there were supplied a clock, rubber mats, snow shovels, brass face plate for letter boxes and some articles of furniture.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## NELSON.

## PUBLIC BUILDING.

A counter railing with wickets, locks and glass shelves was supplied to customs department and the electric light was extended in post office.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## NEW WESTMINSTER.

## PUBLIC BUILDING.

The flag-pole was painted and the ball regilded. The street letter boxes were repainted and there were supplied two chairs, a typewriter desk, a stool and a number of locks.

Work done under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## ROSSLAND.

## DRILL SHED.

This building which was described in my report last year has been completed, fitted up and furnished.

Plans, &c., prepared by this department.

Clerk of works, R. W. Grigor.

Contractor for construction of building, fittings, lighting and heating, Geo. Gillet.

## PUBLIC BUILDING.

Ten window shades, some electric lamps and shades, and some post office locks were supplied under the supervision of Wm. Henderson, of this department, Victoria, B.C.



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## VANCOUVER.

## PUBLIC BUILDING.

The footpath on Pender street frontage and that in lane at rear were graded, concreted, curbed and laid with wood blocks. A portion of the first floor hallway was taken to increase long room and a new door cut in wall of long room; the sorting-room skylights were fitted with prismatic glass; a still and an oven were fitted in gas-testing room; the street letter boxes were painted and office boxes lettered and numbered; a new stamp vendors office was constructed; a black-board was fitted up in hallway; two transoms were fitted up in dead-letter office and one in examining warehouse; a sorting case was extended; the office was fitted up; two pairs of blinds were supplied; the sewer was cleaned, the plumbing overhauled, some closets reset and the coal-chute covered with galvanized iron. Two tables, two cases, shelving, bag hooks, stools, a desk, chairs, book-rack, door springs, paper box, notice board and drawers were supplied; a lavatory basin was fitted up in customs office. The flag-pole was painted and ball regilded. Repairs were made to roofs, flooring, post office, drawers and pigeon-holes, and the doors and windows were painted.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## VICTORIA.

## INDIAN AFFAIRS AND MARINE OFFICE (OLD CUSTOM HOUSE).

A hot water heating system was installed; new gutters and down-pipes were provided and fixed; the deck roof was flashed with galvanized iron and covered with felt and gravel; the sloping roofs were slated; a platform was constructed in rear of the building; the tank shed was rebuilt and fitted with gutters and down-pipes; the roofs of sheds on wharf were shingled; the furnace-room was floored in cement; a notice board was provided; the flag-pole and the dormer cornices were painted and some minor work of repair effected.

Works supervised by Wm. Henderson, of this department, Victoria, B.C.

## ORDNANCE STORE.

A cement sidewalk and approaches to gateway and main doors were laid along Menzies street frontage of government property, under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## CARETAKER'S QUARTERS.

A similar sidewalk to that mentioned in foregoing was laid under the same supervision.

## OLD POST OFFICE BUILDING.

Plumbing repairs were made to water closets, lavatory basins, taps and tanks. The flag-pole was painted and the ball regilded.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## PUBLIC BUILDING.

A platform and steps was constructed for the paper burning furnace; pigeon-hole cases were supplied and placed in post office; a truck for mail carrying was constructed; the street letter boxes and the flag-pole were painted; carpet, linoleum and

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blinds were supplied to the stamp vendors office and brass plates to the post office lockers; some new lights were installed and repairs were made to plumbing, brass-work, elevators, electric bells, electric wiring and lights, plastering, sealing wax heater, heating apparatus and office furniture.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## WILLIAM HEAD.

### QUARANTINE STATION.

A residence for the electrician, quarters for the guards, a brick bath house for the first-class passengers, and a stable and outbuildings were erected; the verandah of the Superintendent's residence was extended and the cellar floor concreted; a bay window was added to the caretaker's residence; the kitchen plastered and a chimney and bay window built at watchman's cottage; a new hot water heating apparatus was fitted and a new drain laid in Superintendent's residence; brick foundations were put under shed at rear of main hospital and partition between power-house and disinfection room; a brick storage battery room with concrete floor was erected; a galvanized iron smoke stack was fixed on the Captain's residence; three sentry boxes and a platform were built for guards; the disinfection shed was fitted with a steam heating apparatus and the isolation hospital with a new boiler; two sets of steps were constructed at main hospital; a brick wall with large double gates was built between end of first-class passengers bath-house and the shore for the convenient handling of suspects; the doors and windows throughout the station were fitted with fly-screens; the grounds were in part levelled, walks gravelled and repaired and grass seed down; rock was blasted out in front of disinfecting building and windows throughout the station in part re-glazed. The following were painted:—Interior of Superintendent's residence, laboratory building, caretaker's residence, laundry and Captain's residence; exterior of the isolation hospital, dining-room of first-class detention building, Superintendent's sheds and a number of fences. The power and boiler houses were kalsomined. Two hundred Hoskins double tiers ships berths, forty hospital spring bedsteads, were supplied as also a spring-wagon with rubber tires, baths, wash basins, sprays, hoppers; and a 30-foot spar for steamer *Earl*. The floor in power-house was repaired and repairs were made to the residences of the Superintendent, his assistant, the Captain, the engineer and the watchman, to the main hospital, Japanese building, first-class detention building, Superintendent's stable, store-room, large gates, electric light plant, fences, &c., &c.

Plans, &c., prepared and work supervised by Wm. Henderson, of this department, Victoria, B.C.

Repairs were made to pipe line including the laying of 1,000 feet of new 4-inch cast iron pipe; the extension of wharf at eastern end and the enlargement and alteration of the disinfecting station and approaches; and repairs to and building and gravelling roads and drives on the quarantine grounds.

Work done under the supervision of this department.

## YUKON TERRITORY.

### BONANZA.

#### MINING INSPECTORS OFFICE.

This building was maintained, heated, lighted and had scavenging service under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

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## CARIBOU.

## MINING INSPECTORS' OFFICE.

The building, which is a rented one, was maintained and heated under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## CLEAR CREEK.

## MINING RECORDERS' OFFICE.

This building was maintained under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## DAWSON.

## ADMINISTRATION BUILDING.

An addition to vault of Gold Commissioner's office was constructed; the grounds were improved; general repairs to the building were effected; the building was maintained, heated, lighted and served with water and ice and scavenging was done. All under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## COURT HOUSE.

Some general repairs were effected; the building was maintained, heated, lighted, and served with water and ice and scavenging was done under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## GOVERNMENT HOUSE.

The grounds were improved; some heating radiators were installed in the building and some general alterations and repairs effected. The building was maintained, lighted, heated and served with water and ice. All the foregoing under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## POLICE COURT.

This building was maintained, lighted, heated, served with water and ice and scavenging was done and had some minor repairs effected, all under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## POST OFFICE.

General repairs were effected; the building was lighted, heated, maintained and served with water and ice and scavenging was done all under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## WAREHOUSE.

This building had water service and maintenance under the supervision of S. A. D. Bertrand.

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## DOMINION CREEK.

MINING INSPECTOR'S OFFICE.

General repairs were effected and the building was maintained, heated and lighted under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## DUNCAN CREEK.

MINING INSPECTOR'S OFFICE.

This building, which is a rented one, was maintained, heated and lighted under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## FORTY MILE.

RECORDER'S OFFICE.

This building was maintained and heated under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## GLACIER CREEK

RECORDER'S OFFICE.

This is a rented building. It was generally repaired, heated, lighted and maintained under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## GOLD-RUN.

MINING INSPECTOR'S OFFICE.

This is a rented building. It was maintained and heated under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## HUNKER CREEK.

MINING INSPECTOR'S OFFICE.

This building was maintained, heated and lighted under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## KLUHANE.

MINING RECORDER'S OFFICE.

This building was constructed, maintained, repaired and heated under the supervision of S. A. D. Bertrand, inspector of public buildings, Yukon Territory, Dawson.

## SESSIONAL PAPER No. 19

## LIVINGSTONE CREEK.

## RECORDER'S OFFICE.

This building, which is a rented one, was maintained, heated and lighted under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## SELKIRK.

## MINING RECORDER'S OFFICE.

This building was maintained and heated under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## STEWART RIVER.

## RECORDER'S OFFICE.

This building was maintained and heated under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## SULPHUR CREEK.

## MINING INSPECTOR'S OFFICE.

This building was maintained, heated and lighted under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

## WHITEHORSE.

## POST OFFICE.

The post office was fitted up with boxes, &c., a desk, stools, file and linoleum were supplied the customs office; a room was fitted up for a mail-room; new latrines were erected and fences were erected around the government property.

Work done under the supervision of S. A. D. Bertrand, of this department, Yukon Territory, Dawson.

## RECORDER'S OFFICE.

This building was maintained and repaired under the supervision of S. A. D. Bertrand, superintendent of public buildings, Yukon Territory, Dawson.

DOMINION PUBLIC BUILDINGS, JUNE 30, 1905, EXCLUSIVE OF THE  
PENITENTIARIES, INDUSTRIAL SCHOOLS, MARINE HOSPI-  
TALS AND MOUNTED POLICE BUILDINGS.

PROVINCE OF NOVA SCOTIA.

Amherst, public building.  
Annapolis, public building.  
Antigonish, public building.  
Arichat, post office.  
Baddeck, public building.  
"       armoury.  
Dartmouth, post office.  
Digby, public building.  
Guysborough, public building.  
Halifax, custom house (in progress).  
"       Dominion building.  
"       drill hall.  
"       examining warehouse (rented building).  
"       immigration building.  
"       quarantine (Lawlor's Island).  
Kentville, public building.  
Liverpool, post office.  
Lunenburg, public building.  
Middleton, armoury.  
Nappan, experimental farm.  
New Glasgow, public building.  
North Sydney, public building.  
Pictou, custom house.  
"       post office.  
"       quarantine station.  
Springhill, public building.  
Sydney, public building.  
"       quarantine station.  
"       Mines, public building (in progress).  
Truro, public building.  
Windsor, public building.  
"       drill hall.  
Yarmouth, public building.

PROVINCE OF PRINCE EDWARD ISLAND.

Charlottetown, Dominion building.  
"       quarantine station (south port).  
Montague, post office.  
Souris, public building (in progress).  
Summerside, public building.

## SESSIONAL PAPER No. 19

## PROVINCE OF NEW BRUNSWICK.

Bathurst, public building.  
Campbellton, public building (in progress).  
Carleton (St. John West), public building.  
Dalhousie, post office.  
Fredericton, infantry school.  
“ military stables.  
“ public building.  
“ sergeant-major's quarters.  
Marysville, post office.  
Middle Island, quarantine.  
Moncton, public building.  
Newcastle, public building.  
Richibucto, public building.  
St. John, custom house.  
“ drill hall.  
“ immigration building.  
“ quarantine (Partridge Island).  
“ savings bank.  
St. Stephen, public building.  
Sussex, public building.  
“ armoury.  
Tracadie, lazaretto.  
Woodstock, armouries (in progress).  
“ public building.

## PROVINCE OF QUEBEC.

Acton Vale, post office (in progress).  
Aylmer, post office.  
Berthierville, post office.  
Buckingham, post office.  
Coaticook, public building.  
Drummondville, public building.  
Dundee, custom house.  
Fraserville, public building.  
Farnham, post office.  
Granby, public building.  
Grosse Ile, quarantine station.  
Hochelaga, post office.  
Hull, post office.  
Joliette, public building.  
Lachine, post office.  
Laprairie, post office.  
L'Assomption, post office.  
Lévis, immigration shed.  
“ cattle quarantine.  
“ public building (in progress).  
Longueuil, post office (in progress).  
Montreal, custom house.  
“ drill hall.  
“ examining warehouse.  
“ inland revenue building.  
“ post office.

Pérignonka, immigration building.

Quebec, artillery workshops.

“ cartridge factory.

“ citadel.

“ custom-house.

“ drill hall.

“ examining warehouse.

“ immigration building.

“ iron foundry.

“ marine agency.

“ observatory.

“ post office.

Richmond, public building.

Rimouski, public building.

Roberval, immigration building.

St. Henri, post office.

St. Hyacinthe, drill hall (in progress).

“ public building.

“ inland revenue building.

St. Jérôme, public building.

St. Johns, public building.

“ infantry school.

St. Louis du Mile End, post office (in progress).

St. Régis, custom-house.

Sherbrooke, public building.

Sorel, public building.

Terrebonne, post office (in progress).

Thetford Mines, public building.

Three Rivers, custom-house.

“ post office.

“ drill hall (in progress).

Valleyfield, post office (in progress).

Victoriaville, public building.

#### PROVINCE OF ONTARIO.

Alexandria, public building (in progress).

Almonte, public building.

Amherstburg, public building.

Arnprior, public building.

Barrie, public building.

Berlin, public building.

Belleville, public building.

Bowmanville, post office.

Brampton, public building.

Brantford, drill hall.

“ public building.

Bridgeburg, post office (in progress).

Brockville, public building.

“ drill hall.

Burford, armoury (in progress).

Carleton Place, public building.

Cayuga, post office.

Chatham, drill hall (in progress).

“ public building.



## SESSIONAL PAPER No. 19

- Clinton, post office.
- Cobourg, armoury and gunshed.
- “ public building.
- Cornwall, public building.
- Deseronto, public building.
- Dundas, armouries.
- “ post office (rented building).
- Fort William, public building.
- Galt, public building.
- Gananoque, custom-house.
- “ post office.
- Goderich, public building.
- Guelph, public building.
- Hamilton, public building.
- “ drill hall.
- “ custom-house (old).
- Hawkesbury, post office (in progress).
- Ingersoll, public building.
- Kingston, custom house.
- “ drill hall.
- “ military college buildings (Fort Frederick).
- “ post office.
- Lindsay, public building.
- London, custom-house.
- “ drill hall.
- “ infantry school.
- “ post office.
- Napanee, public building.
- Niagara Falls, public building.
- Orangeville, post office.
- Orillia, public building.
- Oshawa, post office (in progress).
- Ottawa, central experimental farm.
- “ drill hall.
- “ Dominion archives building (in progress).
- “ eastern departmental block.
- “ fisheries, museum and art gallery.
- “ geological museum.
- “ government house.
- “ Langevin block.
- “ laboratory (bacteriological).
- “ military store building.
- “ observatory.
- “ transit house (in progress).
- “ parliament buildings.
- “ printing bureau.
- “ post office, customs and inland revenue.
- “ royal mint (in progress).
- “ Supreme and Exchequer courts.
- “ Victoria Memorial museum (in progress).
- “ western departmental block.
- Paris, public building.
- Pembroke, public building.
- Petrolia, public building.

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Peterborough, custom house.  
     "            post office.  
 Picton, public building.  
 Port Arthur, public building.  
 Port Colborne, public building.  
 Port Dalhousie, custom house.  
 Port Hope, public building.  
 Prescott, custom house.  
     "            Fort Wellington.  
     "            post office.  
 Rat Portage, public building.  
 Sandwich, post office (in progress).  
 Sarnia, public building.  
     "            immigrant building.  
 Sault Ste. Marie, public building.  
 Smith's Falls, public building.  
 St. Catharines, public building.  
     "            drill hall.  
 St. Thomas, armoury.  
     "            public building.  
 Stratford, public building.  
     "            armouries (in progress).  
 Strathroy, public building.  
 Toronto, custom house.  
     "            drill hall.  
     "            examining warehouse.  
     "            immigration building.  
     "            infantry school and drill shed.  
     "            post office.  
     "            postal station 'A.'  
     "            postal station 'C.'  
     "            Junction, public building.  
 Trenton, public building.  
 Walkerton, public building.  
 Windsor, drill hall.  
     "            public building.  
 Woodstock, armouries.  
     "            public building.

## PROVINCE OF MANITOBA.

Brandon, experimental farm.  
     "            immigration building.  
     "            public building.  
 Birtle, immigration station.  
 Dauphin, immigration station.  
 East Selkirk, immigration shed (old C.P.R. round house).  
 Fort Osborne, infantry school.  
 Minnedosa, immigration shed.  
 Portage la Prairie, public building.  
 Virden, armoury.  
 Winnipeg, custom house.  
     "            examining warehouse.  
     "            immigration building (in progress).

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Winipeg, immigration hospital.  
“ immigration hall.  
“ lands office.  
“ magazine.  
“ post office.  
“ new post office (in progress).

## NORTH-WEST TERRITORIES.

*Alberta.*

Calgary, court house.  
“ immigrant shed.  
“ public building.  
Edmonton, immigration shed.  
“ registry office.  
“ jail (in progress).  
Lethbridge, public building.  
“ immigration building.  
Macleod, custom house.  
“ court house.  
Red Deer, court house.  
St. Mary's, custom house.  
Strathcona, immigration building.

*Assiniboia East.*

Carnduff, court house.  
Indian Head, experimental farm.  
Moosomin, court house.  
Qu'Appelle, immigrant shed.  
Wolseley, court house.  
Yorkton, court house.

*Assiniboia West.*

Medicine Hat, court house.  
“ immigration shed.  
Moosejaw, court house.  
“ public building (in progress).  
Regina, court-house.  
“ council chamber.  
“ government house.  
“ government offices.  
“ immigration shed.  
“ land and registrar's office.  
“ post office.

## SASKATCHEWAN.

Battleford, commandant's residence.  
“ government house.  
“ immigrant shed.  
“ magistrate's residence.  
“ registrar's residence.  
“ registry office.

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Prince Albert, court-house and jail.  
" immigrant shed.  
" land and registry office.  
" public building (in progress).  
Saskatoon, immigration building.

## YUKON TERRITORY.

Clear creek, mining office.  
Dawson, administration building.  
" court-house.  
" commissioner's residence.  
" post office.  
" departmental stores.  
" telegraph office.  
Whitehorse, post office.

## BRITISH COLUMBIA.

Agassiz, experimental farm.  
Kaslo, armoury.  
Kamloops, armoury.  
" public building.  
Nanaimo, public building.  
Nelson, public building.  
" armoury.  
New Westminster, drill hall.  
" public building.  
Revelstoke, armoury.  
Rossland, public building.  
" armoury.  
Vancouver, immigrant building.  
" drill hall and gun-shed.  
" public building.  
Victoria, artillery barracks.  
" drill hall.  
" custom-house (Marine and Indian Affairs offices).  
" military store-house.  
" post office (old).  
" powder magazine.  
" public building.  
William Head, quarantine station.

PART IV

CHIEF ENGINEER'S REPORT

ON

HARBOUR AND RIVER WORKS

INCLUSIVE OF

GRAVING DOCKS AND DREDGING OPERATIONS

ALSO

ROADS, BRIDGES AND SURVEYS THROUGHOUT THE DOMINION.



## REPORT OF THE CHIEF ENGINEER.

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DEPARTMENT OF PUBLIC WORKS OF CANADA,  
CHIEF ENGINEER'S OFFICE,

OTTAWA, January 10, 1906.

FRED. GÉLINAS, Esq.,  
Secretary,

Department of Public Works.

SIR,—I have the honour to submit the annual report on the various works under my charge during the fiscal year ended June 30, 1905.

These works comprise the construction and repair of wharfs, piers, breakwaters, dams, weirs, bank and beach protection works; the improvement of harbours and rivers by dredging; the construction, maintenance and operation of government dredging plant; the construction and maintenance of graving docks; the construction, maintenance and working of slides and booms; the construction and maintenance of interprovincial bridges and approaches thereto, and of bridges on highways of federal importance in the North-west Territories and the maintenance of military roads; also hydrographic and ordinary surveys and examinations, inclusive of precision levelling and geodetic measurements which are required for the preparation of plans, reports and estimates; the testing of cements, &c.

I have the honour to be, sir,  
Your obedient servant,

EUG. D. LAFLEUR,  
*Chief Engineer.*

During the fiscal year 1904-05, surveys and examinations were made at the following places.

## NOVA SCOTIA.

Annapolis, Annapolis County.	Meteghan, Digby County.
Arichat, Richmond County.	Middle Country Harbour, Guysboro County.
Arisaig Breakwater, Antigonish County.	Middle Melford, Guysboro County.
Avonport, King's County.	Mill Cove, Lunenburg County.
Baddeck Inlet, Victoria County.	Mushaboon, Halifax County.
Bailey's Brook, Pictou County.	New Haven, Victoria County.
Barachois, Victoria County.	Newport Landing, Hants County.
Bass River, Colchester County.	Noel, Hants County.
Battery Point, Annapolis County.	North Ingonish, Victoria County.
Baxter Harbour, King's County.	North Harbour (Aspy Bay), Victoria Co.
Bay St. Lawrence, Victoria County.	North River, Victoria County.
Beckerton, Guysboro County.	North Sydney (Breakwater), Cape Breton County.
Black Point, Victoria County.	North Sydney (Dredging), Cape Breton County.
Boisdale, Cape Breton County.	North Sydney (Railway Dry Dock), Cape Breton County.
Burke's Cove, Victoria County.	Nyanza, Victoria County.
Canning, King's County.	Parker's Cove, Annapolis County.
Canso, Guysboro County.	Pembroke, Hants County.
Chegoggin, Yarmouth County.	Petite Rivière, Lunenburg County.
Cheverie, Hants County.	Phinney Cove, Annapolis County.
Church Point, Digby County.	Pictou Island, Pictou County.
Cow Bay, Halifax County.	Piper's Cove, Cape Breton County.
Crooks's Cove, Guysboro County.	Plympton, Digby County.
Cunningham's Point, Guysboro County.	Poirierville, Richmond County.
Devil Island, Halifax County.	Port au Pique, Colchester County.
Dixon's Point, Cape Breton County.	Port Dufferin, Halifax County.
Drum Head, Guysboro County.	Porter's Lake, Halifax County.
East Chezzetcook, Halifax County.	Port Felix, Guysboro County.
East River Bridge, Pictou County.	Port Hawkesbury, Inverness County.
Economy, Colchester County.	Port Hilford, Guysboro County.
Feltzen South, Lunenburg County.	River Bourgeois (Bissett's), Richmond Co.
Freeport, Digby County.	River Bourgeois (Boyd's), Richmond Co.
French Village, Halifax County.	Round Hill, Annapolis County.
Gabarus Harbour, Cape Breton County.	Samson's Cove, Richmond County.
Georgetown, Antigonish County.	Sandford, Yarmouth County.
Gibbon's Bridge (Wharf), Cape Breton County.	Scott's Bay, King's County.
Glace Bay Harbour, Cape Breton County.	Sheet Harbour, Halifax County.
Goose Harbour, Yarmouth County.	Skinner's Cove, Pictou County.
Hall Harbour, King's County.	South Bar, Cape Breton County.
Harrigan Cove, Halifax County.	South Cove Grant, Victoria County.
Hansport, Hants County.	South Ingonish, Victoria County.
Hiltz Narrows, Lunenburg County.	Spry Bay, Halifax County.
Indian Harbour, Halifax County.	Summerville, Hants County.
Iona, Victoria County.	Swivel Point, Cape Breton County.
Irish Vale Pond, Cape Breton County.	Sydney Harbour, Cape Breton County.
Jeddore, Halifax County.	Tangier, Halifax County.
Jeddore Oyster Pond, Halifax County.	Tatamagouche, Colchester County.
Kelly's Cove, Yarmouth County.	Tennyscape, Hants County.
Kingsport, King's County.	
Lennox Passage Bridge, Richmond County.	



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Litchfield, Annapolis County.	Three Island Cove, Richmond County.
Little Bras d'Or, Cape Breton County.	Toney River, Pictou County.
Little River, Annapolis County.	Tracadie (East), Antigonish County.
Little Brook, Digby County.	Upper Washabuck, Victoria County.
Little Judique, Inverness County.	Victoria Beach, Annapolis County.
Little Narrows (North), Inverness County.	West Pubnico, Yarmouth County.
Lower Plymouth, Yarmouth County.	West Chezzetcook, Halifax County.
Lower Ship Harbour, Halifax County.	Weymouth, Digby County.
Mabou Harbour, Inverness County.	Whale Cove, Annapolis County.
Mabou Bridge (Wharf), Inverness County.	Whitney Pier, Cape Breton County.
Manthorn's Cove, Guysboro County.	Wine Harbour, Guysboro County.
Margaree Island, Inverness County.	Windsor, Hants County.
Margaretville, Annapolis County.	Wolfville, King's County.
Meat Cove, Victoria County.	Yarmouth Bar, Yarmouth County.
Meteghan River, Digby County.	Yarmouth Harbour, Yarmouth County.

## PRINCE EDWARD ISLAND.

Bay Fortune Breakwater, King's County.	McPherson's Cove, King's County.
Belle River, Queen's County.	New London Breakwater, Queen's County.
Belfast Pier, Queen's County.	North Cardigan Pier, King's County.
Beach Point, King's County.	Port Selkirk Pier, Queen's County.
Bay View Pier, Queen's County.	Panmure Island, King's County.
Blooming Point, Queen's County.	Queen's Pier (Georgetown), King's County.
Cascumpec, Prince County.	Rustico Breakwater, Queen's County.
China Point Pier, Queen's County.	Red Point Wharf, Queen's County.
Cape Traverse Pier, Prince County.	St. Peters Lake, King's County.
Canoe Cove Breakwater, Queen's County.	Savage Harbour, King's County.
Campbell's Cove Breakwater, King's Co.	St. Peters Harbour, King's County.
Graham's Pond, King's County.	South River Pier, Murray Harbour, King's County.
Greek River, King's County.	Souris Breakwater, King's County.
Grand River, Prince County.	Summerside Harbour, Prince County.
Higgins Shore, Prince County.	Tignish Breakwater, Prince County.
Hurd's Point Pier, Prince County.	Tracadie Harbour, Queen's County.
Lewis Point, King's County.	Victoria Pier, Crapaud, Queen's County.
Mount Stewart, Queen's County.	Wood Islands Breakwater, Queen's County.
Mink River Pier, King's County.	West Point Wharf, Prince County.
Miminigash Breakwater, Queen's County.	

## NEW BRUNSWICK.

Anderson's Hollow, Albert County.	Lord's Cove, Charlotte County.
Ackerley's Wharf, Queen's County.	Lower Dover, Westmoreland County.
Blissville, Sunbury County.	Maquapit Lake, Queen's County.
Belyea's Wharf, King's County.	Mace's Bay, Charlotte County.
Buetouche, Kent County.	Mill's Point, Northumberland County.
Buetouche Beach, Kent County.	Negunac, Northumberland County.
Burnt Church, Northumberland County.	Negro Point, St. John County.
Campbellton, Restigouche County.	Newcastle, Northumberland County.
Chance Harbour, St. John County.	Partridge Island, St. John County.
Chatham, Northumberland County.	Point Wolfe, Albert County.
Colwell's Creek, Queen's County.	Parrsborough, Cumberland County.
Cunning's Cove, Charlotte County.	Quaco, St. John County.
Dipper Harbour, St. John County.	Richibucto, Kent County.
Dover, Westmoreland County.	Richibucto Cape, Kent County.
Durham, Restigouche County.	River St. John, Sunbury, Victoria and Madawaska Counties.
Edgett's Landing, Albert County.	Shippegan, Gloucester County.
Edmundston, Madawaska County.	South Rodney Wharf, St. John County.
Port Dufferin, St. John County.	St. George, Charlotte County.
Great Salmon River, St. John County.	

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Hampstead, Queen's County.  
 Heustis Wharf, Queen's County.  
 Hillsborough, Albert County.  
 Hopewell Cape, Albert County.  
 Hopewell Hill, Albert County.  
 Leonardville, Charlotte County.  
 L'Etang, Charlotte County.  
 Loggieville, Northumberland County.  
 Lower Lincoln, Sunbury County.

Tracadie, Gloucester County.  
 Tynemouth Creek, St. John County.  
 Upper Salmon River, Albert County.  
 Webster's Wharf, Queen's County.  
 Welchpool, Charlotte County.  
 Westfield Beach, King's County.  
 Wilson's Beach, Charlotte County.  
 Washademoak, Queen's County.  
 York Point, St. John County.

## QUEBEC.

Agnes, Beauce County.  
 Anse Eternité, Chicoutimi County.  
 Ashnapmouchouan River, Chicoutimi Co.  
 Belœil, Chambly and Verchères County.  
 Berthier, Berthier County.  
 Bon-Désir, Saguenay County.  
 Boucherville, Chambly and Verchères Co.  
 Bromptonville, Richmond and Wolfe Co.  
 Cap à l'Est, Chicoutimi County.  
 Champlain, Champlain County.  
 Chateauguay, Chateauguay County.  
 Chute Monte à Peine, Joliette County.  
 Coteau du Lac, Soulanges County.  
 Coteau Landing, Soulanges County.  
 Côte Ste. Catherine, Hochelaga County.  
 D'Israeli, Richmond and Wolfe County.  
 Doucet's Landing, Nicolet County.  
 English River, Chateauguay County.  
 Fabre, Pontiac County.  
 Gatineau Point, Wright County.  
 Georgeville, Stanstead County.  
 Godfroye River, Nicolet County.  
 Graham, Vaudreuil County.  
 Hudson, Vaudreuil County.  
 Iberville, St. Johns and Iberville County.  
 Isle Bizard, Jacques-Cartier County.  
 Isle Perrot, North, Vaudreuil County.  
 Isle Perrot, South, Vaudreuil County.  
 Knowlton Landing, Brome County.  
 Lachine, Jacques-Cartier County.  
 Lacolle, Missisquoi County.  
 Lake Labelle, Labelle County.  
 Lake Megantic, Compton County.  
 Lake Nominigüe, Labelle County.  
 Lake St. Francis, Beauce County.  
 Lanoraie, Berthier County.  
 Laprairie, Laprairie and Napierville Co.  
 Lavaltrie, L'Assomption County.  
 Longueuil, Chambly and Verchères County.  
 Magog, Stanstead County.  
 Masson, Labelle County.  
 Nicolet River, Nicolet County.  
 North Temiscamingue, Pontiac County.  
 Norte-Dame de Montauban, Portneuf Co.

Peel Head Bay, Missisquoi County.  
 Pentecôte, Saguenay County.  
 Petit Saguenay, Saguenay County.  
 Phillipsburg, Missisquoi County.  
 Pierreville, Yamaska County.  
 Point Fortune, Vaudreuil County.  
 Point Valois, Vaudreuil County.  
 Point St. Charles, Hochelaga County.  
 Quinn's Point.  
 Repentigny, L'Assomption County.  
 Richmond, Richmond and Wolfe County.  
 Rigaud, Vaudreuil County.  
 River La Guerre, Huntingdon County.  
 River St. Louis, Beauharnois County.  
 Sabrevois, St. Johns and Iberville County.  
 Seven Islands, Saguenay County.  
 St. Firmin or Baie Ste. Catherine, Saguenay County.  
 St. Gédéon Islands, Chicoutimi County.  
 Sorel, Richelieu County.  
 St. Andrews, Argenteuil County.  
 Ste. Anne de la Pêrade, Champlain County.  
 Ste. Anne de Sorel, Richelieu County.  
 Ste. Barbe, Huntingdon County.  
 St. Blaise, St. Johns and Iberville County.  
 St. François de Sales, Laval County.  
 Ste. Geneviève, Jacques-Cartier County.  
 St. Ignace de Loyola, Berthier County.  
 St. Johns, St. Johns and Iberville County.  
 St. Marc, Chambly and Verchères County.  
 St. Matthias, Rouville County.  
 St. Paul de l'Île aux Noix, St. Johns and Iberville County.  
 St. Pierre les Becquets, Nicolet County.  
 St. Stanislas, Beauharnois County.  
 St. Sulpice, L'Assomption County.  
 St. Zotique, Soulanges County.  
 Terrebonne, Terrebonne County.  
 Three Lakes, Beauce County.  
 Valleyfield, Beauharnois County.  
 Verchères, Chambly and Verchères County.  
 Ville Marie, Pontiac County.  
 Verdun, Jacques-Cartier County.  
 Weedon, Richmond and Wolfe County.

## ONTARIO.

Malden,  
 Colchester,  
 Whitby,

Rose Point,  
 Matchedash Bay,  
 Niagara River,

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Thunder Bay,  
Trent River,  
Jones Creek,  
Atherley,  
Wikwemikong,  
Holland River,  
Mud Lake,  
Toronto, Sudbury C.P.R. Line,  
Chemong Park,  
Little Sandy Bay,  
Colborne,  
Thames River,  
Dean Lake,  
Janack's Narrows,  
Barry's Bay,  
South River,  
Peterborough,  
Silverwater,  
Bensford Bridge,  
Bridgeworth,  
Crow's Landing,  
Rossport,  
Rainy River,  
Severn River,  
Fort Frances,  
Echo Bay,  
Dunnet's Landing,  
Scugog River,  
Dayton,  
Spanish River,  
Rama,  
Dyer's Bay,

Jackson's Point,  
Callander,  
Prescott,  
Chute à Blondeau,  
Cornwall,  
L'Orignal,  
Morrisburg,  
Treadwell,  
Wendover,  
Port Stanley,  
Mud Lake,  
Stratford,  
Belle River,  
Dawson Point,  
Besserer's Grove,  
Peelee Island,  
St. Mary's,  
Haileybury,  
Colchester,  
Port Burwell,  
Chenal Ecarte River,  
Mitchell's Bay,  
Johnston's Bend (Chenal Ecarte River),  
Kincairdine,  
Amherstburg,  
St. Joseph,  
Goderich,  
Bayfield,  
Tamagami Station,  
Rondeau,  
Port Bruce,  
Grand River Bridge.

## PROVINCE OF NOVA SCOTIA.

## ADVOCATE HARBOUR.

Advocate is an important town, situated on Greville bay, thirty miles south-west of Parrsborough, having a population of 1,000. The chief industries are farming, lumbering, mining and fishing.

In 1899, the department constructed a wharf at this place at a total cost of \$2,765.41. This wharf was then 360 feet long, 20 feet wide on top, except the last 40 feet which was 30 feet wide, and from 12 feet to 16 feet high. It was constructed of pile-heads 10 feet, thoroughly braced, waled and fastened. It was close-piled for its entire length on the outside and end faces. This close-piling, as in many other places, proved unsuitable to prevent the undertow from affecting vessels moored at the inside of the wharf, so in 1901, a sum of \$431.82 was expended in sheathing these two faces of the work.

During the last fiscal year the sum of \$1,724.22 was expended in widening this work. The entire wharf, with the exception of the shoreward block which has been there for many years, was widened 10 feet by means of additional pile-trestle bents, 10 feet in width, and the whole connected with the other by means of long caps, stringers, and brace piles.

The business at this place, such as loading piling for foreign market, &c., has increased a great deal since this wharf has been constructed, and its usefulness is certainly apparent.

Spring tides rise here 40 feet and neap 34 feet, but the wharf is bare at about half tide, which does not affect its usefulness.

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## APPLE RIVER.

Apple river, Cumberland county, is a village on the river of the same name, 25 miles from Joggins, the nearest railway station. It contains two churches, three stores, one hotel, two saw-mills and a telephone office. Population, 700.

During the last fiscal year, plans and specifications were prepared for a breakwater, but at the end of the year work had not yet been commenced.

Expenditure, \$19.81.

## AMHERST POINT.

Amherst Point, is a post settlement in Cumberland county, at the head of the Bay of Fundy, four miles from Amherst. Population about 200.

A sum of \$3,000 was voted for the construction of a wharf at this place, plans and specifications were prepared but up to June 30, 1905, no action had been taken.

## BADDECK.

Baddeck, the shiretown of Victoria county, is on the northern shore of the Little Bras d'Or lake, near the entrance to St. Patrick's channel.

On June 5, 1903, a report was submitted on the construction of a public wharf on three different sites, and estimates were given of the cost of a wharf on each site, including the cost of property required in connection with each.

An appropriation of \$5,000 was made by parliament for expenditure during 1904-05, but so far, no action has been taken towards construction of said wharf.

## BAILEY'S BROOK.

Bailey's Brook, Lismore, Pictou Co., is a large stream emptying into the Strait of Northumberland, at a point about ten miles to the eastward of the entrance to Merigomish harbour, and six miles to the westward of Arisaig.

The sum of \$2,000 was voted for expenditure during 1902-03 towards the opening of a permanent channel through the beach at the mouth of the brook, to permit boats to enter it for shelter, and for the construction of channel protection works on the outside.

The works proposed to effect these improvements included cutting a channel through the beach, about 290 feet in length and 30 feet wide in the bottom, with a depth of 2 feet at low water spring tides, or 6½ feet at high water; the construction of a shear dam on the western side of the channel, 130 feet in length and 12 feet wide, founded at low water, and protected with sheet piling on the channel face and outer end; and the construction of a breakwater on the eastern side of the channel, 240 feet in length and 20 feet wide on top, constructed of round timber crib-work and extending out into 3 feet at low water, to prevent the sand from closing in, and to serve at the same time as a boat landing.

The amount voted for expenditure during 1903-04, was expended in procuring most of the timber required for the construction of the protection works.

In 1903-04, out of the amount voted for expenditure, viz.: \$3,000, the sum of \$2,742.48 was expended in the construction of the breakwater on the eastern side of the entrance, and in the excavation of the channel above referred to, leaving the construction of the dam still to be done, to complete the proposed improvement.

During the fiscal year 1904-05, the sum of \$1,471.46 was expended in constructing the shear dam; in constructing brush and stone work on the eastern side and at

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inner end of the breakwater; of brush and stonework, 7 feet in width and 5 feet in height, in extension of the breakwater inwards, 64 feet, and deepening the channel.

Total expenditure to June 30, 1905, \$6,213.87.

## BARACHOIS.

Barachois, Victoria Co., is at the mouth of the Barachois river, about three miles to the northward of St. Ann's harbour, and is a snug little boat harbour, formed by an outlying beach, and connected at its southern end with St. Ann's bay, by a shifting channel through the beach.

The sum of \$1,500 was voted for expenditure during 1904-05 towards the formation of a boat harbour, but as there was not any information in the office about the locality and its requirements, a survey was made on December 2, 1904 to ascertain the nature and extent of the work required.

The work asked for is for preventing the channel through the beach from shifting, and as this shifting is caused by the action of the sand along the shore during northerly gales, it can be prevented by the construction of a breakwater on the northern side of the entrance.

The proposed breakwater is 200 feet in length and 15 feet wide on top, with sides sloping 1 in 8, to be constructed of round timber, laid open-faced, fully ballasted and protected on all faces with close-sheathing, driven 2 feet into the ground.

The necessary materials were procured during winter and the work of construction was commenced early in June. At the end of the fiscal year, out of the amount voted, the sum of \$1,499.80 had been expended in constructing the bottom of the crib-work, up to within 2 feet of the top, but only half filled with ballast.

## BARRINGTON PASSAGE.

Barrington Passage is a channel ranging from two hundred feet to half a mile in width, running between Cape Sable island and the mainland; it is used very extensively by the schooners and steamers which are quite plentiful in this part of Nova Scotia. At L.W.O.S.T. there was only nine feet of water to be depended upon in certain portions of the channel, whilst the rest of the channel carried from 14 to 25 feet of water. It was desirable that there should be at least fourteen feet all through this important channel and during the last fiscal year there was expended the sum of \$2,483.62 in deepening the shallow portions.

Some of the large boulders lying in close formation, which hitherto have been considered component parts of a solid ledge or ledges were after examination proved to be separate and distinct boulders. Some were large enough to require blasting, whilst the majority of them were removed by means of slings and steam-winch. The channel was deepened to about 11 feet, except in one place, where it is intended to work next year.

The work performed amounted to the raising and unloading of 475 tons of stone, at an average cost per ton of \$4.22. As there is an extremely strong tide running through this narrow channel, the work could only be performed at certain times of tide. The estimate of this work was about \$5,000 and next year will no doubt see this work almost satisfactorily completed.

Spring tides rise 9 feet, neaps 7 feet.

## BASS RIVER.

Bass river, Colchester county, is a farming and manufacturing village of about 500 people, situated on the north side of Cobequid bay, the eastern arm of the Bay of Fundy. It is half way between Truro and Parrsboro', or about twenty-eight miles from each place. In 1894-95, the department built, by contract, at a cost of \$3,240, a

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public wharf of pile-work, 210 feet long, 40 feet wide, with an ell at the outer end 55 feet long and 40 feet wide. At the outer end of the ell it was found necessary to build a small block of cribwork, containing 8,000 cubic feet, on account of the hard nature of the bottom preventing the piles from being driven to a proper depth. Along its outer face the work is 26 feet high, giving a depth of 22 feet at H.W.O.S.T.

In the fiscal year 1901-02, the department expended the sum of \$1,099.11 in extending the pile wharf built in 1894-95. The extension is 40 feet square, substantially built of pile-work and giving the wharf the form of a T. A small freight shed was also built on the wharf for the accommodation of local shippers and merchants.

In 1902-03, the sum of \$56.06 was expended in enlarging the freight shed on the wharf.

In 1904-05, the sum of \$1,200.03 was expended for renewing the whole top of the wharf, including plank, stringers and guard-timbers, in addition to a number of new fender piles which were very much decayed.

#### BATTERY POINT.

Battery Point, Annapolis county, is a fishing settlement of about 150 people, situated on the east side of Digby Gut, about four miles north-east from the town of Digby, and fifteen miles south-west from the town of Annapolis. In 1904-05, the sum of \$2,062.21 was expended in constructing a breakwater for the protection of the fishing fleet, comprising from forty to fifty boats. The work is 90 feet long, 26 feet wide, 8 feet high at the shore end and 19 feet high at the outer end. The approach is a stone embankment 38 feet long, 26 feet wide and from 4 to 8 feet high.

At the end of the fiscal year the work was completed with the exception of a few fenders.

Spring tides rise 26 feet, neaps 22 feet.

#### BAYFIELD.

Bayfield, Antigonish county, is on the south coast of St. George's bay, eight miles east from Antigonish harbour, and fifteen miles west from the entrance to the Strait of Canso, the harbour being formed by Pomquet island and outlying reefs.

A breakwater 400 feet in length was constructed at Pomquet Point in 1879, and extended a further length of 310 feet in 1888. The work consisted of a cribwork core 18 feet in average width, covered with stone sloping on the seaward side, three to one, and on the inner side one and one-half to one. It continued undisturbed until the occurrence of the great gale of December 1, 1890, when the stone covering was stripped off nearly to high-water level, to within 160 feet of the inner end.

During the years 1892-93, and 1895-96, the breakwater was repaired and extended. The work done included an extension 70 feet in length, with an 'L' or return, at the outer end 40 feet in length.

In the year 1897-98 the sum of \$999.73 was expended in reconstructing the stone covering of the breakwater in places where it had been disturbed. About 4,000 superficial feet of the top was reconstructed with 363 cubic yards of large stone, 163 cubic yards of which was old stone displaced and 200 cubic yards of new stone brought one mile to the public wharf, thence by scow a quarter of a mile to the breakwater.

With the exception of some disturbance of the stone covering and of the displacement of some of the stones forming the covering at the outer end, the breakwater remained in fairly good condition until December 5, 1902, when it sustained serious damage during a northerly gale, accompanied by an exceptionally high tide. The covering stones were carried away for a length of 458 feet (184 to 642 feet from the inner end) down to the top of the cribwork, or to within about  $1\frac{1}{2}$  feet of extreme high water, and deposited over the inner slope; and the covering stones from 726 feet from the inner end outwards, were more or less disturbed. The repairs proposed in-

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cluded the construction of a concrete wall 525 feet in length over the inner face of the cribwork (150 to 675 feet from the inner end) and the replacing of the stone covering.

In 1903-04, the sum of \$6,789.83 was expended in procuring and storing 800 barrels of cement and some other materials, and in the construction of 30 lineal feet of concrete wall.

During the fiscal year 1904-05, the sum of \$4,147.06 was expended in completing the concrete wall, in reconstructing the covering on the south or inner side of the wall, and on its north or seaward side over a distance of 325 feet from its outer end, and in grouting between the covering stones on each side over a distance of 160 feet from the outer end of the wall inwards.

The cost of completing the repairs undertaken is estimated at \$1,600, which amount has been appropriated for expenditure in 1905-06.

## BAY ST. LAWRENCE.

Bay St. Lawrence, Victoria county, is on the northern extremity of Cape Breton island, between Cape North and Black Point.

At the head of the bay and separated from it by a beach of sand, gravel and stone, is a small lake or pond about three-quarters of a mile in length and half a mile in width, with a considerable depth of water.

In 1887, a channel to low water, was opened by the department through the beach into the pond, but as it was not protected from the sea, it soon filled in again.

During 1888-89, the channel, which had been alternately opened by freshets and closed during northerly gales, was reopened and protected on its western side by a cribwork block, 53 feet in length beyond high water mark, and by a work of brush and stone 30 feet in length from high water mark inwards. The channel remained open for a short time after the completion of the protection works, but it was closed again at the inner end of the protection works by sand, during a north-westerly gale. The cribwork block still remains, but the brush and stonework, after having been damaged, was washed out by the sea.

The total expenditure on this work up to June 30, 1889, was \$3,992.17.

The sum of \$5,500 was voted for expenditure during 1904-05 towards the formation of a boat harbour, and instructions to prepare plans and specification for the works required, were received on August 19, 1904, but as there was not any information in the office as to the nature and extent of the works necessary to accomplish the object, the plan could not be prepared until the locality had been visited, and a complete survey of the site made. On June 20 a report was submitted to the department, and the probable cost of the works required to make a permanent channel through the beach, from the bay into the pond, with 6 feet at low water springs, was estimated at \$19,400.

## BECKERTON.

Beckerton, or Port Beckerton, is a harbour on the southern or Atlantic coast of Nova Scotia, about midway between Indian and Country harbours, and about five and one-half miles distant from the entrance of each.

During the fiscal year 1904-05, the sum of \$2,192.03 was expended in procuring materials required in the construction of a block and span wharf to extend to 12 feet at extreme low or to 18 feet at extreme high water, and in constructing the inner block 40 feet in length by 20 feet in width, and the substructures of the second and third blocks each 18 by 20 feet.

The wharf is to be 190 feet in length, including the inner block, 40 by 20 feet, four intermediate blocks each 18 by 20 feet and an outer block or head 24 feet in line of work by 50 feet.



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## BIG HARBOUR.

Big Harbour, or Port Bevis, is on the northern side of the Great Bras d'Or channel, about fifteen miles to the westward of its entrance into the Atlantic.

On April 26, 1904, a contract was entered into, in the sum of \$3,875 for the construction of a wharf near the ferry landing, on the eastern side of the entrance to Big Harbour. The work was commenced on October 10, 1904, and was brought to a satisfactory completion on November 23.

It is a block and span wharf, with creosoted timber substructure, extending to 13 feet at low water, having 81 feet in length and 20 feet in width with an 'L' on the eastern side of the outer end, 20 by 20 feet, and connected with the public road by an approach 113 feet in length. The wharf consists of a shore abutment 11 feet long; an inner block 20 feet long, and an outer block 20 by 40 feet, with openings between them 15 feet long. The blocks are constructed of round timber, properly ballasted and protected by fenders, and with close-sheathing around the outer block.

The expenditure during the last fiscal year amounted to \$3,959.38.

## BIG POND.

Big Pond, Cape Breton county, is on the south side of East Bay, the eastern arm of the Great Bras d'Or lake, about thirteen miles from the head of the bay, and twenty-five miles south-eastward from the City of Sydney.

On January 4, 1904, a contract was entered into, in the sum of \$7,720, for the construction of a wharf, with approach thereto from the public road. The work was commenced on June 30, and completed in a satisfactory manner on October 8, 1904.

It consists of a block and span structure, extending to 11 feet at low water, and a road, 223 feet in length. The wharf is 254 feet in length and 20 feet in width, with an 'L' on the north-eastern side of the outer end, 28 feet long and 24 feet wide; and is made up of a shore abutment 50 feet long, of four blocks 20 feet long, and of an outer block 24 feet by 48 feet, with openings between them, 18 feet in length. The abutment and the blocks are constructed of round timber, with creosoted timber substructure, fully ballasted and fendered, and the faces of the two outer blocks are protected with close-sheathing.

Expenditure during last fiscal year, \$7,900.

## BLACK POINT.

Black Point is situate about seventeen miles south-west of Shelburne and fifteen miles east of Barrington. It has a population of about 500, whose chief pursuits are fishing and farming. Its inhabitants had no adequate facilities for landing freight and in the past have been compelled to boat their supplies for a distance of from five to ten miles.

In the fiscal year 1900-01, this department constructed a wharf at this place at a cost of \$1,826.40. It consists of an approach, constructed in the form of a rock-bank, 47 feet long, 24 feet wide on top and 8 feet high at the outer end; two blocks of stone-filled, log cribwork, each 20 feet long, separated by a span 13 feet long in the clear; and 120 feet in length of pile trestle work. The main wharf is 22 feet in width, with the exception of the outer 20 feet which is 42 feet in width over all and has a depth of about 11 feet at its outer end, at L.W.O.S.T. The pile work consists of pile trestle-vents, separate 10 feet centre to centre of piles, and thoroughly braced, waled and fendered.

During the last fiscal year the sum of \$108.36 was expended in constructing a small freight shed upon this wharf. The shed is 18 feet long by 14 feet wide, and is a convenient and fairly well built structure. Spring tides rise here 7 feet, neaps, 6 feet.



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## BOULARDERIE CENTRE.

Boularderie Centre, Victoria county, is on the southern side of the Great Bras d'Or channel, about eight miles to the westward of the entrance into the Atlantic Ocean and ten miles to the eastward of its entrance into the Little Bras d'Or lake.

On April 25, 1901, a contract was entered into for the construction of a wharf, which was completed on June 30, 1902.

The wharf is 164 feet long and 20 feet wide, with an 'L' at the outer end, 20 feet by 20 feet and consists of an approach of stone, clay and gravel, 10 feet long; of a cribwork abutment, 30 feet long; of two cribwork blocks 20 feet by 20 feet, and of an outer block 24 feet by 40 feet, with 20 feet openings between the blocks, spanned and covered over. The abutment and the blocks, constructed of round timber, are creosoted up to the level of high water, fully ballasted and fendered, and the two outer blocks are protected by close-sheathing.

The depth along the channel face of the wharf, at low water, is 13 feet. Spring tides rise 2 feet.

During the year 1902-03, the sum of \$180.13 was expended in opening a road, 2,100 feet in length, from the wharf to the public road, and during 1903-04, the road was completed, at a cost of \$669.98.

The sum of \$350 was voted for expenditure during 1904-05, for fencing in the road from the wharf to the public road; out of the amount voted, the sum of \$349.87 was expended during the fiscal year in constructing a post and wire fence on each side of the road, and in improving the road itself.

Total expenditure to June 30, 1905, is \$6,110.43.

## BROAD COVE MARSH.

Broad Cove Marsh, Inverness county, is on the Gulf of St. Lawrence, twelve miles south from Margaree harbour.

The wharf at this place, on its completion in 1888, extended 400 feet to 12 feet 10 inches at extreme low water. It was badly damaged in January, 1894, and was subsequently carried away down to below low water to within 207 feet of the inner end. In 1894-95-96, the inner 207 feet was repaired and strengthened, and in 1897-98 a small amount was expended in repairs.

When repairs were undertaken in 1904-05, only 105 feet remained. During the year the sum of \$999.85 was expended in extending what remained of the wharf 25 feet to 2 feet at extreme low water. The work was originally of squared timber, close-faced and had a width of 25 feet on top. The work reconstructed in 1904-05, is of round timber open-faced and close fendered on the northern side.

## BRETON COVE.

Breton Cove, Victoria county, is situated on the north-eastern shore of the Island of Cape Breton, about midway between St. Ann's harbour and Ingonish bay.

On July 18, 1904, a contract was entered into, in the sum of \$5,885, for the construction of a wharf, to serve the purposes of a boat landing and to afford shelter for fishing boats.

The work under contract is a continuous cribwork structure with creosoted timber substructure, extending to 4 feet at low water, 194 feet long and 16 feet wide, with an 'L' on the western side of the outer end, 24 feet by 20 feet and an inclined landing, built on creosoted timber piles, 4 feet wide and 46 feet long, on the inner face, inside of the 'L.'

Work was commenced on May 15, 1905, and carried on in a very satisfactory manner. At the end of the fiscal year the work under contract was nearing completion.

P.S.—The work was finally completed and accepted on July 22, 1905.

Expenditure during last fiscal year, \$6,003.04.

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## CANNING.

Canning, King's county, is a prosperous village of about 1,500 people, mostly engaged in farming and fruit raising, situated on the north or left bank of the Habitant river, which, about two and a half miles below, debouches into the Basin of Minas. It is an important station on the Kingsport branch of the Dominion Atlantic Railway, which connects with the main line at Kentville, eleven miles to the south.

In 1904-05, the sum of \$891.27, was expended in the purchase of timber for the construction of a cribwork wharf.

## CARIBOU ISLAND.

Caribou island, Pictou county, is on the Northumberland Strait, five miles to the westward of the entrance to Pictou harbour.

Caribou harbour, sheltered by Caribou island and a smaller island to the seaward of it, is eight miles in length and one mile in average width. The principal entrance, between the two islands, has a depth of only 4 feet at extreme low water, and the flats between the mainland and the western extremity of Caribou island, are dry at extreme low water, except in a few small channels. Spring tides rise 6 feet, neaps 4 feet.

A causeway of brush and stone, 1,330 feet in length and 18 feet in width, between the mainland and the western extremity of the island, commenced in 1890-91, was after the completion of work undertaken in 1894-95, built up to the level of ordinary high water over 560 feet of its length, and about  $1\frac{1}{2}$  feet below that level over the remaining 770 feet. In 1897 a breach was made through the work near its western extremity, where the bottom was scoured to a depth of about 4 feet at low water, and the top of the low portion, 560 feet to 1,300 feet from the west end, was disturbed in some places. In 1900-01 and 1901-02 the breaches in the brush and stonework were filled in and the work raised to about the level of ordinary high water.

In 1902-03 the sum of \$650.06 was expended in continuing the raising of the brush and stonework, which was brought up to an average of about  $1\frac{1}{2}$  feet above extreme high water.

In 1903-04 the sum of \$1,552.07 was expended in raising the brush and stonework where settlement had taken place, and in placing quarried stone on the seaward side.

During the fiscal year 1904-05 the sum of \$1,224.44 was expended in continuing the placing of quarried stone on the seaward side, in levelling up the roadway and placing stone on the inner side.

The total expenditure to June 30, 1905, \$6,678.95.

## CHEGGOGIN.

Cheggogin, Yarmouth county, is a small fishing and farming village, with a population of 200 people, situated on the Bay of Fundy coast, about five miles north of Yarmouth. The little bay of the same name is one-third of a mile deep, north and south and about the same, east and west, fully exposed to the south-west, but sheltered from every other quarter. It is dry at low tide but at high water has a depth of from 12 to 14 feet.

Over half a century ago a breakwater was built by the proprietors of the marsh, in a position immediately west of the present work. It was totally destroyed about twenty years ago, not a vestige of it being now visible.

In the winter of 1895-96, the inhabitants, aided by a grant of \$45 from the municipal council, built a small breakwater 80 feet long,  $12\frac{1}{2}$  feet wide and from 6 to 11 feet high, on the south side of the stream's outlet. In 1899-1900, the sum of \$598.12 was expended by the department in lengthening the breakwater by the addition of a new block, 60 feet long, 15 feet wide and from 10 to 13 feet high. It is cheaply but substantially built of round-log cribwork of the usual type.

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In 1900-01, the breakwater was further extended a length of 51 feet at a cost of \$692.21. The new block was 11 feet wide on top with side batters of 1 in 12, and from 12 to 13 feet high. In addition to the extension, a piece of the shoreward end of the work was rebuilt, 30 feet long, 8 feet wide and from 7 to 9 feet high, at a cost of \$88.03.

In 1902-03, the sum of \$76.58 was expended in raising the shore end of the breakwater a height of from 2 to 3 feet for the purpose of preventing the gravel and sand from washing over and filling up the mouth of the stream, where the fishermen keep their boats.

In 1903-04, the sum of \$188.67 was expended in the purchase and delivery of timber for the extension of the breakwater.

In 1904-05, the sum of \$1,498.58 was expended in extending the breakwater, by a new block 90 feet long, 15 feet wide and from 13 to 16 feet high, substantially built of round log cribwork of the usual type.

The total expenditure to June 30, 1905 is \$3,142.19.

Spring tides rise 16 feet, neaps 13 feet.

## CHEVERIE.

Cheverie, Hants county, with a population of about 350, is situated on the right or east bank of the estuary of the River Avon, where it debouches into the Basin of Minas, some fifteen miles north of Windsor, the county town. It is a good farming district, but the principal trade of the place is the quarrying and shipment of gypsum to the United States. The quantity, which varies according to the price ruling in the American market, ranges from 20,000 to 60,000 tons per annum. A wharf, about 100 feet long, was built here many years ago by the provincial government. In 1873-74, the Department of Public Works lengthened it 70 feet at a cost of \$2,338.88, the extension being of open round-log cribwork like the old work. In 1882, a further extension of 182 feet was built at a cost of \$5,000. This piece of work is of square timber, close faced, 25 feet high and 25 feet wide on top, the same width as the former, and the sides batter 1 in 12. In 1885, the sum of \$600 was expended in effecting some much needed repairs to the shoreward side of the wharf. In 1884, the department built a detached breakwater 300 feet distant from the outer end of the wharf, for the purpose of protecting the latter from the northerly seas to which it was exposed. This piece of work consists of solid cribwork 130 feet long, 20 feet wide on top, 35 feet wide at base and about 23 feet high, built of square timber and close-faced on all sides. The seaward side, to the height of 10 feet below high water of spring tides, has a slope of 1 to 1, the sloping faces being covered with 6-inch plank. The block is provided with mooring posts to receive vessels coming to berth at the wharf, as well as with ring bolts and ladders.

In 1887-88, the sum of \$500, and in 1896-97, the sum of \$100, was expended on extensive repairs. On the outer 100 feet in length, the flooring, guards and some of the fenders were renewed; on the next 80 feet the guards and three fenders were renewed; on the next 105 feet the work received new ties, stringers, guards, flooring and fenders; on the next 60 feet shorewards most of the flooring was renewed, 205 feet in length of the wharf, included in the above lengths, was raised in height from 1 foot to 3 feet. In all, sixty-nine new fenders were placed and 250 tons of new ballast was put in.

In the fiscal year ending June 30, 1902, the sum of \$768.23 was expended in the purchase of timber for the extension of the detached breakwater built in 1884, as described above.

In 1902-03, the sum of \$2,999.34, was expended in the construction of an extension to the detached breakwater. The new block is 100 feet long, 23 feet wide on top, 22 feet high, battering on the landward side 1 in 4 and plumb on the seaward face, with a break 5 feet high. It is substantially built of stone-filled cribwork and close-sheathed on the seaward side.

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In 1903-04, the sum of \$1,487.29, was expended in completing the work.

In 1904-05, the sum of \$800.02, was expended in renewing the top of the middle third in length of the wharf, 80 feet long, 11 feet deep and 30 feet wide. The appropriation did not quite suffice to complete the work.

Spring tides rise 40 feet, neaps 36 feet.

#### CHETICAMP POINT.

Cheticamp Point, Inverness county, is the southern extremity of Cheticamp island, about one mile to the westward of a beach of shingle closing the south end of Cheticamp harbour, which lies between the island and the mainland, and which is entered from the north.

A contract was entered into on July 16, 1903, for the construction of a breakwater, extending to 5 feet at extreme low water, for the sum of \$12,880.

The work was commenced in May, 1904, and completed on September 23 of the same year.

The breakwater is 370 feet long and 20 feet wide, and consists of 20 feet of stone embankment, 80 feet of stone abutment and 270 feet of round timber cribwork, with creosoted timber substructure, fully ballasted, fendered, and close-sheathed on the seaward face for a distance of 96 feet from the outer end, on the outer end, and on the inner face for a distance of 48 feet from the outer end.

Expenditure during last fiscal year, \$13,093.96.

#### CHURCH POINT.

Church Point, Digby county, is situated on the south-east side of St. Mary's bay, six miles south-west from Weymouth. It has a population of 200 people, engaged in fishing and farming.

The work, which consists of a wharf, a retaining wall and breakwater, appears to have been built between the years 1855 and 1856, at the joint expense of the provincial government and the inhabitants. The expenditure of the government having been \$61,055.66.

In 1875-76, the department expended the sum of \$2,000, the inhabitants contributing an equal amount, in repairing the northern face and in building an ell, 72 feet, long by 20 feet wide, at right angles to it, with the object of preventing gravel from working around the outer end.

The movement of gravel, which is from south to north, has been always more or less a difficulty and detriment to this port. In 1890-91, the gravel having worked around the outer end of the breakwater and formed a bar across the entrance to the loading berth, a small groyne, 40 feet long and 24 feet wide was built, projecting at right angles from the outer or north-west corner of the breakwater. The groyne was extended in 1894-95, a further distance of 30 feet and in 1896-97, by a length of 120 feet and width of 16 to 25 feet, by a height of 10 to 20 feet, all of round-log cribwork. The sluice gates, at the head of the dock, where the fresh water stream makes its exit, were rebuilt in order to cause the stream to scour away the gravel from alongside the wharf front.

In 1900-01, the sum of \$800 was expended in rebuilding 63 feet in length of the wharf front, 16 feet high and from 10 to 20 feet wide, 36 feet of this length being close-piled.

The sluice-way was entirely rebuilt and fitted with double lifting gates instead of single; the floor of the sluice was lowered 5 feet and an apron, extending 13 feet up stream and 50 feet down stream, was constructed of 3-inch plank, well spiked to heavy stringers, bedded in close-packed stone and close-piled at both ends to prevent scour.

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In 1902-03, the sum of \$1,800 was expended in rebuilding 134 feet in length of the wharf wall. The new piece is 15 feet wide at bottom, 18 feet wide at top and 20 feet high, solidly built of stone-filled cribwork.

In 1903-04, the sum of \$2,995.21 was expended in the further reconstruction of the wharf wall, begun in 1902-03. The length of the work built being 158 feet, its height from 19 to 21 feet and its width from 8 to 13 feet.

In 1904-05, the sum of \$2,100 was expended in taking down and rebuilding a piece of wharf wall 100 feet long, 19 to 22 feet high and from 10 to 18 feet wide, in the continuation and completion of the work done the past two seasons.

The total expenditure to June 30, 1905, is \$17,453.02, including a refund of \$1,692 to the provincial government in 1887-88.

This work was transferred to the control of the Marine and Fisheries in June, 1888.

Spring tides rise about 22 feet.

## CLAM HARBOUR.

Clam Harbour, Halifax county, is a small shallow harbour on the south coast of Halifax county, about fifty miles east of Halifax harbour. The population of the place is about 400, scattered around the shores of the harbour and depending almost wholly upon the fisheries. About sixty boats are employed. The main entrance to the harbour is much exposed to south and south westerly winds. The mouth of the harbour being shallow, heavy seas in rough weather break at the entrance, making it impossible for boats to enter at low water and dangerous even at high water. To overcome this difficulty, the inhabitants some years ago cut a small channel through the marsh, to the eastward of Stoddart island, between the main harbour and Little Harbour, which is sheltered and safe to enter. This little channel was about 5 feet wide, 3 feet deep and 1,200 feet long.

In 1904-05, the department expended the sum of \$287.10 in deepening and enlarging this channel which is now 10 feet wide and 5 feet deep. It is through marsh or mud flats and wholly above L.W.O.S.T.

## CLARK'S HARBOUR.

Clark's Harbour is a town of about 1,700 inhabitants, situate on the south-west side of Cape Sable island, and is considered the second in importance of all Nova Scotia fishing towns. The channel in this harbour is dotted here and there with numerous small and large boulders, and in order to make a safe anchorage as well as safe channel, a competent diver was employed to make the necessary examination, so as to see what could be done to remedy this serious detriment to navigation.

The sum of \$2,993.40, was expended in partially performing the work required which was estimated, upon the report of a diver, to cost about \$7,000.

The same plant as that employed at Barrington was employed here and though hampered, neither by strong and adverse tides nor by heavy seas, yet the cost per ton for raising and removing the rocks here was higher than in the former place; the reasons being that the boulders and stones were much smaller, and those which had to be blasted were so shattered that it took much longer to collect the different fragments and swing them on board the vessels. The number of tons raised here was 575, making the average cost about \$5.22 per ton, or just \$1 more than at Barrington Passage. Spring tides rise 10 feet, neaps 7 feet.

## COUNTRY HARBOUR.

Country Harbour, Guys-borough county, is on the Atlantic coast of Nova Scotia, immediately west of Isaac Harbour. It has, four miles inland, an excellent land-locked anchorage in  $4\frac{1}{2}$  to 7 fathoms depth, and is navigable for large vessels  $6\frac{1}{2}$ , and for small

vessels to Narrows Point,  $8\frac{1}{2}$  miles inland. Boats can ascend the river to the head of tide, two miles above Narrows Point.

Of the amount appropriated for expenditure in 1904-05, a small amount, \$140.66 was expended in June, in procuring materials and plant and in making preparations for carrying on the work of removing obstructions.

#### COW BAY.

Cow Bay, Halifax county, is situated on the east side of the mouth of Halifax harbour, on the Atlantic coast, about two miles east of Devil Island. It is a broad bay formed by a narrow strip of beach, about a mile in length, separating the Atlantic from a fresh water lake having an area of about  $1\frac{1}{4}$  square miles. The outlet of the lake, which is a small brook flowing through the beach, is used by the fisherman of the locality for the purpose of taking their boats into the lake for shelter in stormy weather. The action of the sea has, however, many times caused the outlet to fill up with gravel, flooding the shore of the lake and making access thereto impracticable. A heavy freshet in the early spring of 1902, swept the gravel out of the inlet and enlarged it to greater dimensions than it hitherto had. To maintain the usefulness of this outlet, the department during the fiscal year 1903-04, expended the sum of \$2,063.94 in the purchase and delivery of timber for the purpose of constructing a substantial breakwater.

In 1904-05, the sum of \$2,000, was expended in constructing a breakwater for which timber was delivered in 1903-04. The work, which is substantially built of stone-filled cribwork, is 200 feet long; the shoreward half length being 10 feet wide and from 6 feet to 8 feet high, the outer half 16 feet wide and from 9 feet to 10 feet high. At the end of the fiscal year the work still lacked fenders and covering.

#### COW BAY (PORT MORIEN).

Cow Bay (Port Morien), Cape Breton county, is on the eastern coast of Cape Breton island, about 18 miles to the eastward of the entrance to Sydney harbour.

A breakwater built by the owners of the Gowrie Coal Mine on the north side of the bay, came under the charge of the department in 1873. It originally extended 1,374 feet to 17 feet at low water, or to 23 feet at high water, and was about 44 feet in width. The area of the basin inclosed between it and the shipping pier of the Gowrie mines, now the property of the Dominion Coal Company, was seventeen acres, ten acres of which had a depth of from 9 to 17 feet at low water.

The breakwater was seriously damaged during the great gale of August 24, 1873. Extensive repairs and improvements were made nearly every year up to 1895 when the breakwater consisted of 220 feet of old work protected on the seaward side by a beach of shingle and boulders, 360 feet of old work 44 feet in width, with a new inner face-work and a breakwater on the seaward side built over the remains of the old work, and 793 feet of inner work with counterforts and connecting outer face works. The inner and outer face works were from 30 to 20 feet apart; they were connected by tie-walls and the spaces were filled with earth and stone ballast.

In 1895 and 1896, 260 feet of breakwater (1,114 feet from the shore end outward) was carried away down to from 2 to  $6\frac{1}{2}$  feet below low water; the outer face work from 1,114 feet from the shore end inward, was badly damaged, and ballast was washed over the works and deposited in the dock along the inner face, from 581 feet to 1,114 feet from the shore end.

Between the years 1897 and 1901, a large amount was expended in repairing and strengthening the breakwater from 1,114 feet from the shore end inward. The outer works were repaired and strengthened by filling in the face-chambers to about half tide level with concrete and by close-piling; the stringers and covering of the inner-work, from 581 feet to 1,114 feet from the shore end, were renewed and the work of placing a talus of concrete blocks on the seaward side was commenced.



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In 1902-03 the sum of \$10,005 was expended in repairing and strengthening the breakwater; the new work including the reconstruction of 87 feet of outer face-work 24 feet in width and 15 feet in average height, of which the outer face-chambers were filled with concrete and the outer face close-piled; and in the reconstruction, to within 1 foot 4 inches of the top, of part of outer end, 49 feet in length, 24 feet in width and 15½ feet in average height which remained to be completed and to have the outer face-chambers filled with concrete and the outer faces close-piled.

In 1903-04 the sum of \$21,266.79 was expended in continuing the work of repairing and strengthening the breakwater, in progress in 1902-03. The work performed included the completion of a block 49 by 24 feet at the outer end of outer face-work and its extension to form a block 49 feet square, of which the outer face-chambers are filled with concrete and the outer face close-piled; in constructing 218 feet of new face-work, 9 feet wide and 11 feet in height, inside of the old outer face-work 226 to 444 feet from the inner end, and in filling it with concrete over 109 feet from its outer end inwards; in reconstructing, filling face-chambers with concrete and close-piling, 112 feet of outer face-work from the inner counterfort (600 feet from the inner end) outwards; and in levelling up and covering with concrete, the space between the inner and outer works from 600 feet from the inner end outwards.

During the fiscal year 1904-05 the sum of \$12,695.09 was expended in continuing the work of repairing and strengthening the breakwater. The work performed included filling face chambers on the seaward side with concrete (a) over 131 feet, 8 feet wide by 11 feet deep, 216 to 347 feet from the inner end; (b) over 75 feet, 8 feet wide and 14 feet deep, at the outer end and south face of the inner counterfort; (c) over 140 feet 9 feet wide and 12 to 14 feet deep, 720 to 860 feet from the inner end; (d) in two chambers at outer end, respectively 10 x 11 x 16 feet deep and 9 x 9 x 18 feet deep; paving with concrete between the inner and outer works, 600 to 642 feet from the inner end, 8 inches deep; constructing an angle block of concrete to connect the outer face-work with the new crib block, 216 to 232 feet from inner end; reconstructing roadway (a) 12 feet wide and 4½ feet deep over 199 feet, 234 to 433 feet from inner end; (b) 16 feet additional width over 122 feet, 234 to 356 feet from inner, including in both cases new floor-stringers and covering, renewing floor-stringers, covering and laying some ballast; (a) over 150 feet of outer work, 433 to 583 feet from inner end; and (b) over inner counterfort, 58 x 24 feet which was also raised 2 feet; close-piling, (a) outer face over 134 feet, 234 to 368 feet from inner end; (b) 11 feet of the south face of the inner counterfort; (c) outer face over 191 feet 666 to 857 feet from inner end; and (d) 20 feet of north face of the central counterfort; reconstructing 130 feet of timber breast-work, 5 to 10 feet in height above covering, at back of inner work, and nearly opposite the central counterfort; constructing a stone filled crib block 40 x 20 x 9 feet high on the seaward side and adjoining the concrete angle block, 216 to 232 feet from inner end; and constructing a shed, for the stone crusher, 72 feet x 17 feet with 8 feet posts.

## CRIBBIN'S POINT.

Cribbin's Point, Antigonish county, is on the west side of St. George's bay, eight miles to the southward of Cape George, and five miles to the northward of the entrance into Antigonish harbour.

The wharf, completed in 1892-93, extended 300 feet in a southerly direction from the point, and has an approach 195 feet in length. It is 20 feet in width for a distance of 120 feet from the inner end, and 30 feet for the remaining 180 feet, the inner 50 feet being of stone, and the outer 250 feet of close-faced timber work, fully ballasted.

The native face-timbers having become weakened by the ravages of the teredo, during 1896-97-98-99, the outer end, the seaward face for a distance of 20 feet and the inside face for a distance of 10 feet were close-piled with creosoted timber piling; a talus of quarried stone was placed on the seaward side over a distance of 180 feet from

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the outer end; the work was re-ballasted where necessary, and a 'timber break' 100 feet in length and  $2\frac{1}{2}$  feet in height, above the cap-timber, was constructed on the seaward side of the inner end of the wharf, to prevent the sand outside from washing on to the work, during storms.

During 1899-1900, the sum of \$1,000 was expended in obtaining a portion of the creosoted timber required in the construction of a proposed extension of the wharf.

During the year 1900-01, the sum of \$3,079.98 was expended in procuring the balance of the timber required for the extension, and in repairing the outer end of the old work, which was almost destroyed during the severe gales in the autumn of 1900. The repairs consisted in the re-construction of the top of the outer end of the wharf, for a distance of 66 feet and to an average depth of 8 feet and in placing heavy quarried stone in the talus on the seaward side of the reconstructed work.

As the sand at the end of the wharf, at which there were originally 11 feet of water, at low water, had made up to a height of about 6 feet, since its completion, leaving but 5 feet of water at low water, it was deemed necessary to found the extension on the original bottom, and the dredge 'George McKenzie' was engaged from May 30 to July 12, 1901, in dredging out the foundation for the new work and the approaches thereto, at a cost of \$1,604.44.

During the year 1901-02, the sum of \$2,896.31 was expended in the construction of the extension to the wharf, for which the materials were procured during 1899-1900-01. The new block is 48 feet long and 20 feet wide and it is placed across the end of the wharf, forming an 'L' 18 feet in length, intended to retain the stone in the talus. The block is of an average height of 20 feet, and is constructed of round timber cribwork, laid open-faced with creosoted timber substructure, close-sheathed on all outer faces, and filled in solidly with ballast.

During the year ended June 30, 1905, an amount of \$2,127.22, was expended in close-sheathing the whole of the inner face of the old work; a portion of the top at the inner end, comprising floor-stringers, covering and cap, was renewed; the stone retaining wall at the inner end was repaired; the 'timber break,' on the seaward side of the inner end, was extended a distance of 75 feet, the cap and covering were renewed where necessary; new ballast was placed where it had settled, and additional heavy stone was placed in the talus.

The total amount expended on this work to June 30, 1905, is \$23,838.77, including the cost of dredging.

#### CUNNINGHAM'S POINT.

Cunningham's Point, Guysborough county, is on the southern side of Milford Haven river (Guysborough harbour), an extensive inlet at the head of Chedabucto bay, eight miles inland, and within half a mile of the head of navigation for small vessels.

During the fiscal year 1904-05, the sum of \$103.58 was expended in procuring nearly all the timber, except floor-stringers and covering, required for a wharf extending 92 feet from high water to 10 feet 6 inches at extreme low water, and in constructing the substructures of the inner and central crib blocks. The wharf, when completed, will consist of a stone abutment and embankment, two crib blocks each 18 feet by 20 feet and an outer block 20 feet by 40 feet with one span of 13 feet and two of 16 feet.

Spring tides rise 6 feet.

#### D'ESCOUSSE.

D'Escousse, Richmond county, is a thickly settled district on the north-eastern coast of Madam island, and on the southern side of the entrance into Lennox Passage, a strait separating the Island of Madam from Cape Breton island, and connecting St. Peter's bay with the Strait of Canso.

The harbour is formed by outlying islands and connecting beaches, and the entrance is from the eastward through a narrow channel obstructed by a bar, with 10 feet



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at low water. It is about three-quarters of a mile in length and one-third of a mile in width, and has a depth of about 21 feet at low water springs, which rise 6 feet.

On March 23, 1903, a contract was entered into, in the sum of \$4,388, for the construction of a public wharf and warehouse, the work of construction was commenced on July 27 and was brought to a satisfactory completion on November 21, 1903.

The wharf is a pile structure, with creosoted timber bearing piles, beyond the line of low water; it extends to 12 feet at low water, and is 307 feet long and 22 feet wide, with an 'L' on the western side of the outer end, 22 feet by 22 feet. The warehouse is constructed on a pile foundation, on the eastern side of the inner end of the wharf, and is 30 feet long by 20 feet wide, with 10 feet posts. The sides and roof are boarded in and shingled, and painted. The floor is laid double, and the building has four windows and a large sliding door, all properly fastened.

During the spring of 1904, the inner end of the work for a distance of 137 feet was lifted (to a height of about 3 feet in the centre) by the force of heavy ice rising with the tide, and the sum of \$900 was voted for expenditure during 1904-05, to repair the damage. Out of that amount, the sum of \$899.78 was expended in the construction of cribwork blocks under the damaged portion of the wharf and under the warehouse, and in lowering the top down to its original level, but the amount granted did not prove quite sufficient to complete the work proposed.

## DEVIL ISLAND.

Devil Island, Halifax county, is a small low island about 2,000 feet in length by 1,000 feet wide, with its highest point about 15 feet above H.W.O.S.T., situated about eight miles to the south-east of the city of Halifax, and one-third of a mile from the mainland of Hartland Point, to which it is connected by a reef, covered with three feet of sand, and having 3 feet of water over it at low tide. The island is permanently inhabited by about 100 people, wholly dependent upon fishing for their livelihood.

In 1892, a breakwater, 300 feet in length, 15 feet in width, with an 'L' at the outer end, 30 feet in length, at which there is a depth of 5 feet at L.W.O.S.T., was constructed at a cost of \$1,941.18.

In September, 1893, the sum of \$87.96 was expended in close-sheathing, 100 feet in length of the western or seaward face of the breakwater, in order to prevent the sea from washing the gravel from under the ballast floor and obstructing the berths for boats on the eastern side.

In 1899-1900, the sum of \$97.13 was expended in petty repairs, rendered necessary by damage done by a severe storm March 1, 1900.

In 1903-04, the sum of \$249.68 was expended in repairs and improvements. Of this sum, \$149.68 was expended in filling the spaces between the face-logs with new timber rendered necessary by the eating away of the old timbers by the limnoria. The outer end was also re-ballasted. The remaining \$100 was expended in building a small wing or break on the western side of the shore end of the breakwater, to prevent the gravel from washing in past the shore end of the work. The new block is 35 feet long, 10 feet wide and 7 feet high, well and strongly built of round-log cribwork filled with stone.

Spring tides rise 6 feet, neaps, 5 feet.

In 1904-05, the sum of \$499.48, was expended in building a small breakwater on the northern point of the island, to prevent the sea from washing around and disturbing boats lying at or near the old breakwater, on the west side. The new work is 155 feet long, 15 feet wide and from 4 feet to 8 feet high, substantially built of round-log cribwork and filled with stone ballast.

On June 19, 1905, a contract was entered into with Messrs. Reid and Archibald, of Halifax, to construct a new breakwater immediately to the west of the old work, which was so far eaten, by both the teredo and the limnoria, as to be in a tumble-down condition and of very little further service. The amount of the contract was \$5,980. The

work to the level of half tide is to be built of creosoted timber, which was furnished and delivered by the department.

Total expenditure in 1904-05, \$4,144.28.

#### DIGBY.

Digby, Digby county, is the shire town of the county, with a population of about 1,500 and is beautifully situated on the south-western end of Annapolis basin. It is an important station on the Dominion Atlantic railway, 67 miles north of Yarmouth, 150 miles from Halifax, 20 miles from Annapolis and is also the port of call for the daily steamer of the Dominion Atlantic railway plying between Digby and St. John. The harbour is open at all seasons and well protected from nearly all quarters; storms, however, from the north and north-east drive a heavy sea against the pier, and if, at such times, there be much drift ice in the basin, the structure is likely to suffer damage.

The first pier was built by the government of Nova Scotia some years before confederation, and was nearly destroyed by the gale which swept the Bay of Fundy in 1866-67. In 1869, to aid in rebuilding the work, the sum of \$2,920 was granted by parliament and transferred to be expended by the provincial government. The pier, as then built, was of pile-bents, 12 feet apart for 550 feet; next a block of cribwork 80 feet long, 45 feet wide, the southern half of which sloped so as to form an incline, rendered necessary by the great rise and fall of the tide (24 feet at springs). The incline was finished by a block 170 feet long by 22 feet wide, the northern half of this portion of the pier being all pile-bents, 8 feet apart. The outer end of the pier consisted of a block 56 feet long, 45 feet wide and about 40 feet high. The whole of the northern face was close-piled, the total length of the structure being 870 feet.

In 1872 the sum of \$1,650 was expended by the department in completing and repairing the pier. In 1874 a number of piles and braces were renewed, the outer block newly fendered and new joists and planking laid for the total length. During the gale of February 22, 1879, a schooner loaded with produce for the West Indies parted its cable and was swept bodily through the pier carrying away a length of 130 feet, which was rebuilt at a cost of \$2,367.73.

In 1881-82 the sum of \$888.57 was expended in renewing a few piles and other timbers that had been eaten away by the limnoria.

In December, 1885, the outer end of the pier was destroyed by a severe gale and in 1885-86, the sum of \$1,945.62 was expended in repairs.

In 1886-87, a further sum of \$767.62 was expended on the same repairs.

In 1887-88 the sum of \$7,467.68 was expended in the construction of a block, 40 by 40 feet, on the site of the displaced outer block; of an inclined landing 26 feet wide and 80 feet long, between the new outer block and the undestroyed inner portion of the pier; and the building of a roadway on pile and frame bents, connecting the whole work with the new outer block. In January, 1888, operations were begun towards building the pier to its original length, and the departmental report for the year 1888-89, shows an expenditure of \$4,498.14. The new work consisted of a new block 45 feet by 45 feet to replace the former one. It is built of round timber, with double sets of face-logs and is fully ballasted; it is 45 feet high and connected with the outer portions of the work by a cribwork inclined landing, over the top of which a deck wharf is carried on heavy frame bents. The inclined landing and its superstructure is 25 feet wide. The inshore or pilework section was strengthened and repaired in places, and parts of the worn and decayed planking were renewed. In 1889-90, heavy piles were driven along the northern and southern sides of the centre block, which was shifted and damaged by a storm in December, 1885, to prevent any further movement.

In 1890-91, and again in 1891-92, small expenditures were made on general repairs.

In 1890, a contract was entered into for the construction of a landing pier on a

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new site, namely, on the north side of the 'Racquet' about a mile to the northward of the present pier and the town of Digby. For this purpose a quantity of timber and iron had been secured by the contractor. Owing, however, to numerous delays, and the death of the contractor, the intention of building this new pier was abandoned and it was decided instead to repair and re-construct the present pier, utilizing, as much as possible, the timber and iron, belonging to the estate of the deceased contractor. The work of re-construction was carried out by day labour at a cost of \$15,248.18.

In April, 1894, a length of 330 feet of close-piling along the north side of the pier, together with the caps and walings for the same distance and about ninety of the outside bearing and fender piles were destroyed by a violent gale. In order to save the balance of the structure from the scouring action of the under-tow set up by the sheet piling, the rest of it was immediately cut out and the sheet-piling and other timber that had been knocked adrift was saved piled up on the inner wharf. Subsequently, in May and June, 1894, the sum of \$1,410.03 was expended in making good the damage done by the April storm. The sheet-piling, having proved a mistake it was not replaced but about ninety new, heavy piles were driven and thoroughly braced and bolted.

In 1895-96, the sum of \$4,341.99 was applied in filling with substantial close-piled trestle work, a space or recess on the north side of the pier, near its outer end, 210 feet long by an average width of 17 feet, and in raising from 2 feet to 3 feet, and renewing the entire floor of the outer 225 feet in length.

In 1896-97, the sum of \$3,132.89 was applied to the re-construction of the southern half of the shore end of the pier for a length of 450 feet, in substantial pilework. The new work was covered with 6-inch plank and securely capped fendered and braced. In the year 1898-99, the sum of \$579.80 was expended in the renewal and repair of the outer south corner of the pier which was damaged by being struck by the Dominion Atlantic steamship 'Prince Rupert,' during a south-east blow in April, 1899. In addition to this, 40 feet in length of the inclined slip was replanked with 6-inch plank and a couple of new fenders were bolted into position.

In 1900-01, the sum of \$2,000 was expended in necessary renewals. The work done consists of the replanking of the wide part of the inclined slip 125 feet long by 25 feet wide, the narrow part 87 feet long by 17 feet, and a portion of the floor of the main wharf, 18 feet by 22 feet, with 6-inch spruce deals.

In addition to this, an open shed 100 feet long by 33 feet 7 inches wide, was erected at the outer end of the present pier and office, and over the inclined slip to protect freight when landed from steamers.

The importance of this pier may be gathered by the fact that the collection for wharfage dues now amounts to nearly \$3,000 per annum.

In 1901-02, the sum of \$3,300 was expended in repairs and improvements. The old freight shed was moved 100 feet up the pier and raised 4 feet in height. Adjoining it outwardly there was built a new shed 202 feet long, the upper 100 feet in length being built with the floor on a level with a box car and the lower 100 feet built level with the floor of the pier. A portion of the pier floor was also renewed. The arrangement is now most satisfactory and convenient for the handling of freight.

In 1902-03, the sum of \$3,697.77, was expended in re-building the lower 60 feet, in length of the inclined slip. Owing to this portion of the work, which was of cribwork, being much injured by the limnoria, the new portion was built of pile-work, the piles being driven through the ballast cribs. It was difficult and expensive work. In addition to this, a considerable portion of 6-inch plank on the shoreward end of the pier was renewed, and a number of the long hardwood fenders that had been broken by the daily steamer from St. John were renewed.

In 1903-04, the sum of \$313.15, was expended in renewing two hardwood fenders, building a stairway from the main dock to the inclined slip and putting new eaves-gutters, down-spouts and a few other petty and miscellaneous repairs to the freight shed.

In 1904-05, the sum of \$1,440.60, was expended in renewing a considerable portion of the 6-inch flooring, which was worn out under the steamer freight traffic.

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The total expenditure to June 30, 1905, is \$81,026.94, including a refund of \$11,623 to the provincial government, in 1887-88, and not including an expenditure of \$4,192.02 in dredging.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

Spring tides rise 24 feet, neaps about 20 feet.

## EATONVILLE.

Eatonville is situate on the south-east side of Chignecto channel, about ten miles north-east of Cape Chignecto.

In 1887-88 a breakwater, 123 feet long, 20 feet wide and with an average height of 15 feet was built by the department at a cost of \$2,000.

During 1888-89, the sum of \$3,000 was expended by the department in an extension 80 feet in length, but when this extension was about half finished it was seriously damaged.

In 1889-90, at a cost of \$2,000, the extension begun the year before was satisfactorily completed. The whole work was strongly built of round-log, stone-filled crib-work, close-sheathed on the outer side with 6-inch flatted spars.

In 1892 a further extension shorewards this time, was built, about 200 feet long, 20 feet wide and from 10 to 19 feet high. Its outer face is close-piled for its entire length. The cost was \$2,700.

In 1895 the sum of \$250 was spent in repairs and during the fiscal year 1899-1900, the sum of \$791.40 was again expended in repairing this work.

During the last fiscal year the sum of \$174.26 was expended in repairing the top of the outer piece of this work.

Spring tides rise here 40 feet, neaps 34 feet.

## EAST BERLIN.

East Berlin, Queen's county, is a small fishing and farming settlement about 11 miles north-east of Liverpool, with a population of about 300.

In 1902-03, the department commenced the construction of a breakwater at this place; work was completed in 1903-04, at a total cost of \$2,692.87.

The sum of \$1,000 was granted towards the extension of the breakwater, but, owing to the fact that no competent foreman was available nothing was done during the last fiscal year.

## EAST CHEZZETCOOK.

East Chezzetcook, Halifax county, is a deep inlet, situated about 20 miles to the east of Halifax harbour. The inlet is surrounded by a population of some 300 or 400 people engaged in fishing and farming. In 1904-05, the sum of \$4,093.24 was expended in the construction of a detached breakwater, for the purpose of forming a shelter for fishing boats and other craft. The work is 420 feet long, 14 feet wide and from 6 to 8 feet high, substantially built of cribwork, and resting on a substructure of brush and stone 20 feet wide and 2 feet thick.

## EAST END. CAPE SABLE ISLAND.

East End, is applied to the eastern end of Cape Sable island, which portion of the island had no refuge for boats but the breakwater at Stony island.

The inhabitants of the vicinities asked that a pond, situated at the East End, be opened and made available for a harbour of refuge for small boats. The work consisted in dredging a channel to below L.W.O.S.T. and building protection groynes.

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The sum of \$3,000 was appropriated for that purpose. During the last fiscal year a channel was dredged 365 feet long, 20 feet wide, with a depth of water, at H.W.O.S.T. of 7 feet; though not completed, it now can be used at half tide by the fishing boats which draw from 4 feet to 5 feet. The protecting walls are 380 feet and 330 feet long respectively, 10 feet wide on top, and an average height of 11 feet. They are built of continuous stone-filled cribwork, well fendered and fastened.

Spring tides rise 9 feet, neaps 7 feet.

Expenditure during last fiscal year, \$2,606.17.

## EAST HARRIGAN COVE.

East Harrigan Cove, Halifax county, is a fishing and mining settlement of about 200 people, situated nine miles east of Salmon river or about sixty-five miles in an air line east of Halifax. It is two and a half miles east of Harrigan Cove proper, where a small public wharf was built in 1901-02.

In 1904-05, the sum of \$1,180.02, was expended in constructing a public wharf of pile-work, 50 feet square and 20 feet high at the outer end, giving a depth of water, at H.W.O.S.T., of about 16 feet. The wharf is approached by a stone and earth embankment 44 feet long, 50 feet wide and of an average height of 5 feet. A road approach of about 500 feet remains to be constructed.

## EAST JEDDORE.

East Jeddore, Halifax county, is a settlement of about 600 people, scattered along the eastern side of Jeddore harbour, about thirty miles east of Halifax and ten miles west of Ship Harbour. The inhabitants engaged chiefly in fishing, the fleet comprising ten schooners and a number of small boats. The harbour is an excellent one with a good shelter and easy approach, the channel being from 20 feet to 40 feet deep, and from 800 to 1,000 feet wide. Hitherto there has been no loading or landing pier in the harbour and goods shipped by or landed from schooners have had to be transferred to and from the vessels in boats. In the fiscal year ending June 30, 1904, the department expended the sum of \$1,403.88 in constructing a pile-wharf, 100 feet long, 25 feet wide and with an 'L' at the outer end giving a face length of 40 feet. The height of the work along the outer face is 20 feet giving a depth of water, at L.W.O.S.T., of about 10 feet.

In the year 1904-05, the sum of \$928.07, was expended in repairing and partially re-building the work which was seriously damaged during the winter by exceptionally heavy ice.

## ECONOMY.

Economy, Colchester county, is situated on the north side of the Basin of Minas, 17 miles west of Great Village and twenty-one west of Parrsboro'.

A wharf was built by the department in 1887-88, 208 feet long and 25 feet wide, at a cost of \$2,500. In the summer of 1890 an extension was built 100 feet long and 25 feet wide with an 'L' 25 feet long on the outer end, at a cost of \$2,500. In the summer of 1891 an extension was built, 100 feet long and the same width as the rest of the work, at a cost \$2,200. In the autumn of 1891, a third extension was built 55 feet in length at a cost of \$1,000. The whole structure was substantially built of round-log cribwork, well ballasted and double-fendered. Its average height is about 18 feet at the outer end. At H.W.O.S.T., there is about 16 feet of water.

In 1895-96 the sum of \$159.45 was spent in laying new plank flooring for 190 feet in length of the shoreward portion, and putting in some new fenders on the outer block.

Owing to the mud flats in the cove, where the present wharf was built, gradually filling up with mud, this wharf has become almost useless, and in 1903-04, the sum of \$2,071.78 was expended in building a new pile-wharf at the mouth of the

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little creek or brook, farther east than the old wharf. The new structure is a pile wharf, 200 feet long, 25 feet wide with an 'L' on the outer end giving a face length 45 feet and depth of water, at H.W.O.S.T., of 16 feet.

In 1904-05, the sum of \$1,000 was expended in taking apart and rebuilding the pile-wharf built in the previous year, which was lifted by exceptionally heavy ice in the previous winter. In addition to this two small pieces of cribwork, 70 feet long on the east side and 80 feet long on the west side of the shore end of the wharf, were built for the purpose of protecting the beach carrying the public road. Each piece of cribwork is 10 feet wide and from 6 to 8 feet high.

Spring tides rise 48 feet, neaps 42.

#### FINLAY POINT.

Finlay Point, Inverness county, is on the west coast of Cape Breton island, three miles north of the entrance to Mabou harbour.

In 1902-03 the sum of \$529.78 was expended in procuring all the timber, with the exception of floor-stringers, covering and guard-rails, and nearly all the iron required in the construction of a proposed wharf.

In 1903-04 the sum of \$1,466.22 was expended in procuring the balance of the materials required and in nearly completing a wharf of cribwork, 15 feet in width on top, extending from low water, 146 feet to 3 feet at low water, with an approach of brush and stone 170 feet in length. At the end of the year the cribwork was completed with the exception of the fenders, covering and guard-rails over 82 feet from the inner end outwards, and the brush and stonework was nearly up to the required height.

During the fiscal year 1904-05, the sum of \$984.51 was expended in completing the cribwork and in reconstructing the brush and stonework, and placing a talus of quarried stone on its seaward side.

Spring tides rise 4 feet.

Total expenditure to June 30, 1905, \$2,980.51

#### FORT LAWRENCE.

Fort Lawrence is situated at the mouth of La Panche river, and was formerly the proposed terminal of the now defunct Chignecto Ship Railway. It is about three miles west of Amherst town and is the nearest approach to navigable waters for that town.

This very important manufacturing centre was desirous of having some means of shipping their manufactures, &c., and bringing in their imports, consequently they asked for the construction of a public wharf at Fort Lawrence.

A contract for the construction of this work was let to Messrs. Lyons & White, for \$14,895; it was completed on 30th day of November, 1904. Besides this there was also another contract let to the same firm amounting to \$1,137, for fendering the inner side of the wharf which at first was not contemplated, but owing to the fact that two good berths for large vessels could be thus procured was recommended.

This wharf starts from the dyke on the bank of the river, and runs out almost at right angles to a sand bank, for a distance of 249 feet with a width of 36 feet on top; it then turns and runs as nearly parallel to the bank as possible for a further distance of 300 feet, this latter portion being 50 feet wide on top over all. Its height at the outer end and in fact along the entire frontage (the 300-foot portion) is 48 feet. It is constructed of pile-trestle bents, separated 8 feet from centre to centre of pile-heads, whilst the lateral piles are driven 7 feet apart from centre to centre of pile-heads. The outside and inside bearing piles are double-fendered and pile-braced. All the timber is of the heaviest nature obtainable in this country. The height of the shoreward section runs from 2 to 44 feet.

Spring tides rise here 41 feet and neaps 34 feet.

Total expenditure during last fiscal year. \$12,798.50.



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## FRENCH VILLAGE.

French village, Halifax county, is a small scattered village of about 150 people, chiefly engaged in fishing, situated on the east side of St. Margaret's bay, twenty-one miles west of Halifax.

In 1904-05, the department expended the sum of \$2,037.67 in constructing a pile-wharf, 150 feet long, 25 feet wide, with an 'L' on the outer end, giving a face length of 60 feet and a depth at L.W.O.S.T., of about 18 feet.

Spring tides rise 6 feet, neaps, 5 feet.

The shore approach to the wharf is a rock bank, 50 feet long and from 3 feet to 6 feet high.

## GABARUS.

Gabarus bay, on the Atlantic coast of Cape Breton island, is five miles wide at its entrance, between White Point and Cape Gabarus.

In 1901-02, a breakwater extending 190 feet to  $12\frac{1}{2}$  feet at low water, was constructed at Harbour Point near the head of the bay. The inner section, 70 feet in length, is 16 feet in width and the outer section, 120 feet in length, is 24 feet in width on top. The inner section is constructed of round timber cribwork and the outer of squared timber close-faced, with creosoted timber substructure.

A contract was entered into May 4, 1905, for the construction of an extension of the breakwater 128 feet in length to  $17\frac{1}{2}$  feet at low water, for the sum of \$19,009 to consist of an inner section,  $47\frac{1}{2}$  feet in length and 24 feet in width on top, and an outer section,  $80\frac{1}{2}$  feet in length and 30 feet in width on top, of squared timber, close-faced, with ties of round timber and with creosoted timber substructure, fully ballasted, fendered and close-sheathed on the seaward face, at the outer end and on the inner face, for a distance of  $15\frac{1}{2}$  feet from the outer end.

Spring tides rise 5 feet.

## GABARUS HARBOUR.

Gabarus harbour, Cape Breton county, on the eastern side, and near the head of Gabarus bay, is of limited area but of great value to the fishermen.

Expenditures were made in 1873-74 and in 1880-81, in deepening the entrance, through rock, to about 1 foot at extreme low water.

During the fiscal year 1904-05, the sum of \$1,584.91 was expended in opening a new channel, through rock, clay and boulders, 25 feet in width and from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  feet in depth at low water, to the westward of the former entrance, with the intention of obtaining, ultimately, a uniform depth of  $3\frac{1}{2}$  feet at low water and a width of 30 feet at bottom.

Expenditure to June 30, 1905, \$4,759.96.

## GEORGEVILLE.

Georgeville, Antigonish county, is on the southern shore of Northumberland strait, six and a half miles south-west from Cape George.

A wharf was constructed in 1892-93, to afford the inhabitants shipping and landing facilities. It was 207 feet in length and 20 feet wide, with an 'L,' 20 feet by 20 feet on the eastern side of the outer end; but during 1896-97-98, an extension, 44 feet in length, 40 feet in width, with an 'L,' 20 feet by 24 feet was added thereto, making a total length of 251 feet by 20 feet wide for a distance of 187 feet, 40 feet wide for a distance of 40 feet, and 60 feet wide for the remaining distance of 24 feet. The inner

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end of the wharf for a distance of 87 feet was of stone, covered with plank, and the remainder of the work, of squared timber cribwork, protected by sheathing and fenders. The depth of water at the outer end, at low water, is 7 feet.

During the severe north-west gale of September 12, 1900, which caused so much damage in the Gulf of St. Lawrence, the woodwork on the stone approach was partly lifted by the sea and removed several feet, and the sum of \$291.23 was expended in putting it back into position, but it was shortly after again disturbed by the sea during a heavy gale.

During 1901-02, the sum of \$699.47, was expended in removing and taking apart the woodwork on the top of the stone approach; the stone wall was taken down to a depth of 4 feet and in its place cribwork was substituted, fully ballasted and covered with the old plank, and the outer faces of both cribwork and stone wall were close-sheathed.

The sum of \$2,500 was voted for expenditure during 1903-04, towards the extension of the wharf, 50 feet in length and 25 feet wide, with an 'L,' 40 feet on the western side of the outer end.

The authority for the expenditure of the amount was received on November 14, 1903, too late in the season to commence work of construction, but plan and specification for the work were prepared, the necessary materials were procured during the winter and spring, and all was ready to commence construction at the end of the fiscal year; and out of the amount voted the sum of \$2,499.70 was expended during the year.

The sum of \$2,000 was voted for expenditure during 1904-05 in the construction of the extension, the materials for which were procured during 1903-04.

The substructure was constructed in two separate blocks, one for the extension proper, the other for the 'L.' The first was successfully placed in position and secured, and the second was also placed in position, but before it could be sufficiently ballasted, it was disturbed by a gale, and moved several feet away from the other. Steps were at once taken to refloat it back into position, but before this could be accomplished, a second gale removed it still farther to the westward. Owing to the lateness of the season, orders were given to complete the extension, independently of the 'L,' and to haul the wrecked block ashore and save the materials in it. The extension block was completed, the wrecked block was brought ashore, taken apart, and the materials were saved and secured, and in doing so the appropriation became exhausted.

Spring tides rise  $4\frac{1}{2}$  feet.

#### GRAND ETANG.

Grand Etang, Inverness county, is situated on the Gulf of St. Lawrence, about midway between the harbours of Margaree and Cheticamp.

The opening of a channel through a beach which separated the waters of the gulf from a large and deep fresh water pond, and the construction of channel protection works to make the pond available for use and shelter of fishing boats and small vessels, necessitated the diversion of the highway and the construction of a bridge across the pond, 500 feet above the former crossing.

The bridge was 563 feet in length, including the east and west approaches of brush and stone, with crib-work abutments, respectively, 94 and 51 feet in length, and 435 feet of pile work. It was provided with a hand-rail on both sides, an opening for boats and a draw. The depth at extreme low water over the central 200 feet of the length of the work was about 6 feet and to firm bottom, through water and soft mud, from 21 to 24 feet. The piles having been weakened by the ravages of the teredo, temporary repairs were made in 1898-99 and 1899-1900. In 1901-02 the sum of \$2,799.35 was expended in temporary repairs and in procuring all the creosoted piling and part of the native timber required for its reconstruction.



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In 1902-03 the sum of \$2,779.78 of which \$1,279.78 was paid out of appropriation for the following year, was expended in temporary repairs to the old bridge and in procuring the balance of native timber required and constructing a new bridge parallel to and distant 9 feet from the south or inner side of the old bridge.

It having been ascertained that the piles in three bents at the east end of the new bridge, and in one bent at its west end, had been raised slightly by the ice, authority was obtained in June, 1904, to expend the sum of \$300 in placing brush and stonework to prevent further lifting, but up to the close of the fiscal year 1904-05, only the sum of \$52.75 had been expended.

The total expenditure in connection with works at Grand Etang to June 30, 1905, was :

On channel and protection works. . . . .	\$ 23,870 64
On bridge construction, 1904-05. . . . .	3,690 20
On repairs to bridge and construction of new bridge. . . . .	5,385 08
	<hr/>
	\$ 32,945 92
	<hr/>

## GRAND NARROWS.

Grand Narrows, Cape Breton county, is on the south-eastern side of the Barra strait, which connects the Great with the Little Bras d'Or lake. It is an important station on the Intercolonial Railway, at the southern end of the railway bridge which spans the strait at this place, and is also a landing place for steamers, which call twice a day with mails and passengers for and from Baddeck, and make connection with the express trains going east and west.

The old wharf was 287 feet in length, including 67 feet of cribwork filled with brush and stone and covered with gravel; 80 feet of pilework built in 1885-86 by the department over the remains of an old landing pier, built by the provincial government; and an extension 140 feet in length, built by the department in 1883-84. The extension consisted of three blocks, each 20 feet by 20 feet, and an outer block or head, 20 feet in line of work and 60 feet in length, with openings between them of about 16 feet.

Repairs were made upon the structure from time to time, but owing to natural decay and the ravages of the teredo, it fell eventually into a dangerous condition; it was decided to re-construct it with creosoted timber piling.

During the year 1901-02, the sum of \$1,711.50 was expended in procuring the largest portion of the materials required in the re-construction of the wharf, including the creosoted piling.

During 1902-03, the sum of \$1,300.66 was expended in re-constructing the work with pile-work, to the end of the old work and 10 feet beyond; the work being 297 feet long, 24 feet wide for a distance of 277 feet and 30 feet wide for the remaining distance of 20 feet, with a depth of 11 feet, at low water, at the outer end.

In order to render the wharf accessible to steamers of a greater draught, the sum of \$3,500 was voted for expenditure during 1903-04, towards the extension of the wharf to 15 feet at low water, a distance of 57½ feet, on the centre line, and the construction of an 'L,' 30 feet by 30 feet, on the southern side of the outer end.

Plan and specification for the proposed pile-work were prepared, all the necessary materials were obtained, but as the creosoted timber required was not delivered until the latter part of June, construction could not be commenced by the end of the fiscal year; and out of the amount voted, the sum of \$2,466.37 only, was expended.

During the fiscal year 1904-05, the sum of \$1,435.49 was expended in the construction of the pile-extension, for which the materials were procured during the previous year.

The total expenditure on this work up to June 30, 1905, including a refund of \$1,289.70 paid to the provincial government is \$12,600.24.

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## GRAND RIVER.

Grand River, Richmond county, is a small tidal stream rising in Loch Lomond and emptying into the Atlantic ocean, six miles to the eastward of the entrance to St. Peter's bay. The entrance is obstructed by a bar of sand over which there is a depth of about 3 feet at extreme low water, and was, until recent improvements were made, rendered dangerous by several large rocks. Inside, the channel carries 6 feet at extreme low water to within half a mile of a bridge crossing the river, three miles inland.

Spring tides rise  $6\frac{1}{2}$  feet.

In 1903-04, the sum of \$648.41 was expended in removing two large rocks, points of reef, one on either side of the entrance.

During the fiscal year 1904-05, the sum of \$485.35 was expended in removing a large rock on the western side of the entrance, thus completing the improvements undertaken.

## GREEN COVE.

Green Cove, Victoria county, is a small fishing station on the north-eastern coast of Cape Breton island, about midway between North bay, Ingonish and Neil's Harbour, being about five miles north from the former and four miles south from the latter.

The cove is a small indentation in the general coast line, about 400 feet in depth and 900 feet in width, protected by a reef on the southern end, and by outlying ledges from the eastward.

During 1889-90, the sum of \$200 was expended by the department in improving the landing for boats at the northern end of the cove, by the removal of bed-rock and boulders off the beach.

On February 4, 1903, a contract was entered into for the sum of \$6,475 for the construction of a breakwater extending from the shore to the innermost of the outlying ledges, a distance of 450 feet.

The construction of the breakwater was commenced on August 4, 1903, but owing to an extremely stormy autumn, causing considerable damage and consequent delay, the progress was slow, and up to the end of December following, when work had to be suspended for the winter, only about one-half of the work was completed. The work was resumed on the opening of navigation in May, 1904, and at the end of June it was completed, excepting some slight trimming of the stone slopes.

The work was finally completed and accepted on July 8, 1904.

The breakwater is 450 feet long and 16 feet wide at a height of 2 feet above high water, with sides sloping 3 to 1 on the outer, and 2 to 1 on the inner face, with top rounded: the inner 180 feet consisting of a quarried stone embankment and the outer 270 feet of a quarried stone embankment with cribwork core.

Expenditure during last fiscal year, \$492.50.

## GROSSES COQUES.

Grosses Coques, Digby county, is situated at the mouth of a small river that enters St. Mary's bay, about seven miles south-west of Weymouth, and three miles from Belliveau's Cove. The settlement comprises a scattered population of about 300 people engaged in farming and to a small extent, in fishing.

The works here, which were begun by the inhabitants, aided by grants from the provincial government, in or before the year 1852, consist of a sea-wall, or more properly a river-wall, a breakwater and a short groyne, all built of round-log cribwork, more or less filled with stone ballast.

The river-wall is 620 feet long, from 15 to 22 feet wide, from 15 to 18 feet high along the face and with its top about 5 feet above H.W.O.S.T. In 1889-90, this work

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having become much dilapidated, and portions of its face having fallen into the stream, the department expended the sum of \$3,000 in thoroughly restoring it.

The breakwater, which is parallel to and about 70 feet distant from the river-wall is 550 feet long, 12 to 15 feet wide, 8 to 12 feet high, and with its top about level with H.W.O.S.T. It is roughly built of round-log cribwork and partially filled with stone. In 1889-90, when the department restored the river-wall, the breakwater was partly rebuilt by the inhabitants.

The groyne at the outer end of the river-wall was 100 feet long, 15 feet wide and from 6 to 10 feet high. To a certain extent it served to keep the gravel from washing into the channel between the breakwater and the river-wall, but it became a complete wreck several years ago.

In 1904-05, the sum of \$1,917.70 was expended in improvements and renewals. The work done consists of the extension of the breakwater on the south side of the stream mouth by a new block 60 feet long, 20 to 26 feet wide and from 16 to 20 feet high. On the shore end and south side of this new block the ancient groyne was restored by the construction of a new block 70 feet long, 10 feet wide and 6 feet high. On the north side of the stream mouth, the old breakwater was extended by a new block 100 feet long, 11 feet wide and from 8 to 12 feet high, the whole of the above work is of solid stone filled cribwork.

The total expenditure by the department to June 30, 1905, is \$4,917.67.

## GUNNING COVE.

Gunning Cove, Shelburne county, is a small village of about 200 people, situated on the south-west side of Shelburne harbour; it is the centre of a scattered population of about 1,200.

In 1899-1900, the department constructed a landing pier at this place.

During the last fiscal year, an expenditure of \$100 was authorized for slight repairs to the wharf which had been damaged by ice owing to the fact that it was absolutely impossible to procure men to work, a railway being constructed along this shore which took all the available labour, there was nothing done this year, but before winter it is expected that the matter will be attended to.

## GULL ISLAND.

This is the local name of a small shore village about four and a half miles south of Liverpool town, and one and a half miles west of Western Head. It has a population of about 150, almost exclusively engaged in the fishing industry. The harbour is partially protected by means of a small partially submerged and rocky islet, but on its southern side, it was absolutely unprotected.

In order to permit these people to pursue their occupation more profitably, the department, during the last fiscal year, constructed a small breakwater at this place. Its total cost was \$1,580.96.

This breakwater consists of a stone and cement approach 25 feet long, 24 feet wide on top, and 4 feet high on the average, but, 8 feet high at its outer end; the breakwater proper is built of continuous cribwork, stone-filled, well fendered, fastened, covered and sheathed on the outer end and outside face with 5-inch hewn sheathing. It is 105 feet in length, 17 feet in width on top, with a batter of 3-inch to the foot and from 9 feet to 12 feet in height.

Spring tides rise here 7 feet, neaps 5 feet.

## GRANITE VILLAGE (PORT HEBERT).

Granite village, otherwise known as Port Le Hebert, is a scattered settlement or group of settlements of about 250 people situated along both sides of an inlet, about four miles in length, midway between Liverpool and Lockport. From the head of

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this inlet for miles the country is covered with timber. Mills have operated here for years and adequate shipping facilities have never been afforded the people. They stated that mooring piers situated at the edge of the channel, on the extreme edge of the flats, would meet their requirements.

During the last fiscal year this mooring pier was constructed by the department, at a cost of \$782.64.

This pier is 40 feet in length, 40 feet in width and 12 feet in height containing approximately 19,200 cubic feet, thus making the cost slightly over 4 cents per cubic foot. It is constructed of continuous, round-log, stone-filled cribwork, well fendered, covered and fastened.

#### HALL'S HARBOUR.

Hall's harbour, King's county, is situated on the south side of the Bay of Fundy, about sixty-five miles north-east from Digby gut, twelve miles south-west of Scott's bay, and about twelve miles north-west from Kentville, the county town of King's, and the headquarters of the Dominion Atlantic railway.

The harbour, though small, is one of the best, at H.W., between Scott's bay and Digby gut.

Spring tides rise 39 feet, neaps 33.

The village has a population of some twenty families, and some years ago had a considerable shipping trade, which, however, of late years has dwindled to insignificant proportions.

About the year 1839, the inhabitants, aided by the provincial government built timber retaining walls on both sides of the harbour, which consists of a land locked basin, dry at low water, of about an acre in extent, to permit vessels to lie alongside the public road. About 1844, an addition seawards to the wall, on the west side, was built, in order to check the accumulation of gravel at the mouth of the harbour and to serve as a breakwater. About 1885, an addition of 100 feet in length was built to this breakwater at a cost of \$2,000.

In 1884, it was repaired by the department at a cost of \$750. On November 6, 1884, the outer block was destroyed by a violent gale, the accompanying heavy seas having also the effect of depositing a bank of gravel which almost entirely obstructed the mouth of the harbour.

Between 1884 and 1891, the only expenditure made upon the work was the sum of \$49.97, applied in sheathing the exposed and broken ends. In 1891, the sum of \$500 was spent in rebuilding the face of the timber retaining wall on the eastern side of the harbour, 270 feet long. In November, 1893, the sum of \$100 was spent in a few much needed repairs to the breakwater on the west side. In 1895-96, the sum of \$450.83 was expended in repairs to the breakwater on the east side and the south or shoreward end was raised from 2 to 5 feet, the whole top, 102 feet in length was relaid with new 6-inch flatted spars with new floor stringers. Twenty-six new fenders were placed, a new piece of break was built on the north side of the shoreward end, 30 feet long, 5 feet high and 5 feet wide; the shore end was also filled with ballast and levelled up with gravel.

During the year 1898-99, the sum of \$191.68 was expended in repairing the old breakwater, the work done consisting of the close-sheathing of several weak spots on both the outer and inner sides, the renewal of a considerable portion of the floor and the placing of a number of new fenders and mooring posts.

In 1899-1900, the breakwater was extended 120 feet at a cost by contract of \$3,200. The new work is 26 feet wide on top, from 14 to 20 feet high, substantially built of round-log stone-filled cribwork of the usual type, battering 1 in 6, and close sheathed vertically on the outer side and battering 1 in 12 on the inner side. The outer end is also close sheathed, and along the seaward face is a break 4 feet 6 inches high.

In 1904-05, the sum of \$1,140.50 was expended in beginning the construction of a dam and sluice immediately above the public road bridge, at the head of the little

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harbour. The object of this is to afford a means of scouring away the gravel that accumulates alongside the breakwater and obstructs the entrance of schooners.

This work was transferred to the control of the Department of Marine and Fisheries, June 12, 1888.

## HAMPTON.

Hamilton, Formerly Chute's Cove, Annapolis county, is situated on the south-east side of the Bay of Fundy, twenty-seven miles north-west of Digby gut and six miles north-west of Bridgetown, an important station on the Dominion Atlantic railway. It has a population of about 200 people, engaged in fishing, farming, and the export of cordwood and timber.

In 1855 and 1856, a small pier, 165 feet long, was built near the western side of the cove, the provincial government contributing \$600 to its cost. The site was chosen by commissioners, apparently without professional advice and was objectionable on many accounts. At a cost of \$3,000 in 1879, an addition of 121 feet was made by the department, and the older portion of the work was strengthened with the hope of remedying some of the defects of the location.

In 1881, on further examination it was found that the original work had been badly undermined by the sea and that owing to the direction of the pier the shingle was fast shoaling the water on the inside. It was therefore decided to rebuild the structure on another site about half a mile to the eastward, which was carried out at a cost of \$2,300. The new pier, as then completed, was 246 feet long, more substantially built and much better located than the old one, it being situated immediately to the westward of a small brook, which serves to keep the schooner berth alongside free from sand. In 1888-89 it having been found that the stream had worked under the foundations, endangering the whole structure, the department expended the sum of \$750 in close-piling the inner-face, levelling up the top of the work, which had settled in places, putting in some additional ballast, and effecting general repairs to the covering and break.

In February, 1889, during a heavy freshet, the brook again gave some trouble, tearing away its banks and the gravel beach, and threatening to undermine the breakwater.

In 1890-91, the department spent \$31 in repairing the damage and in turning the brook into its original channel. In 1892-93, the breakwater being found not quite long enough to give convenient berth to schooners, the department applied the sum of \$1,500 in constructing a block 40 feet long, 27 feet wide on top and 27 feet high on the outer end, and in repairing about 100 feet of the inner end of the old work by raising the inner face, putting in new floor stringers and covering them with new planking, thus putting the work in a thorough state of repair.

In the year 1898-99, the sum of \$1,999.79 was expended in the thorough repair of the breakwater. The whole top of the work for the outer 185 feet in length, 20 feet to 26 feet in width, was raised with new work for a height of from 2 feet to 4 feet, rendered necessary by the great and unequal settlement of the work, caused by the scouring action of the little stream that discharges alongside and had made its way beneath it. To prevent a repetition of this action, the inside face of the breakwater was protected for a length of 80 feet with a puddle wall, faced on the outer side with 3-inch plank. The breakwater had a total length of 270 feet a width of from 20 feet to 26 feet, and a height at the outer end of 24 feet where at H.W.O.S.T., there is a depth of 21 feet of water.

In 1902-03, the sum of \$207.62 was expended in sheathing with close-piling about 53 feet on the shore end of the east side of the breakwater, to prevent the little stream that issues to the east of the breakwater from undermining the work.

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In 1903-04, the sum of \$49.99 was expended in renewing a small quantity of close-sheathing that was torn off by ice during the previous winter.

In 1904-05, the sum of \$1,198.06 was expended in constructing a small breakwater on the east side of the mouth of the stream for the purpose of preventing the gravel from washing into the mouth of the creek and obstructing the schooner berth, alongside the main breakwater. The new work, which is substantially built of round-log cribwork of the usual type, is 20 feet long, 15 feet wide and 9 feet high at the shore end, and 21 feet wide and 14 feet high at the outer end.

The work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

Spring tides rise 32 feet, neaps 18 feet.

#### HANTSPOUT.

Hantsport, Hants county, has a population of about 1,500 and is situated on the left or west bank of the Avon river, here one and three-quarters mile wide, about half way between Windsor and the mouth of the river, where it enters the Basin of Minas. It is an important station on the Dominion Atlantic railway, seven miles from Windsor and fifty-three miles from Halifax.

In 1897-98, the department built a public wharf. It is a strong, well-built structure of stone-filled cribwork, 200 feet long, 32 feet wide, with an 'L' 32 feet long on the outer end, giving a face length of 64 feet where it has a height of 26 feet. At high water there is a depth of 23 feet along the face of the work. At low water the beach is dry.

In 1901-02, the sum of \$200 was expended in under-pinning with timber and brush, the south-east corner of the work which had been undermined by the current during ebb spring tides.

In 1904-05, the department expended the sum of \$400 in building a freight shed in the angle of the 'L' of the wharf, 25 feet by 15 feet, the construction of a flight of steps at the outer end of the wharf for the greater convenience of passengers, and in raising and widening the approach.

#### INDIAN HARBOUR.

Indian Harbour, Halifax county, is a small fishing village of some 200 or 300 people, situated twenty-nine miles west of Halifax by public road or about sixteen miles on an air line. It is on the east side of the mouth of St. Margaret's bay, eight miles south of French Village. In 1904-05, the sum of \$1,160.50 was expended in constructing a public wharf for the convenience of local trade and fishing. The wharf is constructed of block and span, the blocks being of substantial cribwork, filled with stone and well fendered. It is 20 feet wide with an 'L' at the outer end, giving a face length of 50 feet along which the work is 17 feet high and with a depth of water of 13 feet at H.W.O.S.T. The approach to the wharf consists of an embankment of stone and earth, 150 feet long and from 3 feet to 5 feet high. At the end of the fiscal year the work was not quite completed.

Spring tides rise 6 feet, neaps 5 feet.

#### IONA.

Iona, Victoria county, is on the northern side of Barra strait, which connects the Great with the Little Bras d'Or lake. It is a station on the Intercolonial railway at the northern end of the Grand Narrows bridge, and a landing place for the steamers of the Bras d'Or Steam Navigation Company.



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During the winter months, ice and weather permitting, a steamer carrying mails and passengers, keeps up daily communication between Baddeck and Iona, and as at times, owing to the presence of ice and other causes, the draw in the bridge cannot be opened, and the steamer could not reach the old wharf on the western side of the bridge, during 1901-02-03, a block and span wharf, with creosoted timber substructure, 260 feet in length and extending to 10 feet at low water, was constructed by the department on the eastern side of the bridge and connected with the railway station by a road, 350 feet in length. The inner end of the wharf, for a distance of 138 feet, is 20 feet wide and the outer 122 feet, 30 feet wide.

On April 22, 1904, the ice, forced in by northerly winds, destroyed the outer 30 feet of the superstructure of the outer block, leaving the creosoted substructure uninjured. During 1904-05, the sum of \$1,373.99 was expended in re-constructing and strengthening the outer end, and in placing the wharf in condition to carry trains.

On May 20, 1904, a contract was entered into for the construction of an extension to the wharf, 140 feet long and 30 feet wide, consisting of blocks and spans, with creosoted timber substructure, fully ballasted and fendered, close-sheathed on all outer faces, and close-piled with creosoted timber piling on the outer end, and on each side of it for a distance of 16 feet.

The construction of the extension was commenced on September 22, 1904, and satisfactorily completed on December 6, following.

Expenditure during last fiscal year, \$12,078.92.

## IRISH COVE.

Irish Cove, Cape Breton county, is on the south-east shore of the Great Bras d'Or lake, near the entrance to East bay. The distance to the head of East bay is twenty miles, to St. Peter's canal about twenty-two miles, and across the lake, to Grand Narrows, ten miles.

The wharf at this place, completed in 1892-93, is 160 feet 8 inches long and 20 feet wide, including a shore block 47 feet in length, a central block 20 feet 4 inches in length, and an outer block 57 feet in length with an 'L' 20 feet by 20 feet. It was strongly constructed, fully ballasted, and had the exposed faces of the outer block protected by close-piling. In 1898-99, 1900-01 and 1902-03, part of the close-piling of the outer block (which has been either damaged or destroyed by the teredo), was renewed and some other repairs were effected, including the renewal of 60 lineal feet of guard rail and the replacing of about 20 tons of ballast.

During the fiscal year 1904-05, the sum of \$1,000.04 was expended in completing the renewal of the close-piling of outer block; in renewing the close-piling of three sides of the central block; in renewing the guard rail at outer end and western side of outer block and at western side of the central block.

The total expenditure to June 30, 1905, amounted to \$5,058.56.

## ISLAND POINT.

Island Point, Victoria county, is on the south side of Boularderie island, eighteen miles from the bridge crossing the Little Bras d'Or at the head of St. Andrew's channel, an arm of the Bras d'Or lake.

A wharf 120 feet in length and 20 feet in width, with an 'L' at the outer end, 20 feet by 21 feet, extending to 11 feet at ordinary lake level, and consisting of blocks and spans, was constructed by the department during 1886-87.

During 1892-93, the sum of \$499.48 was expended on repairs to the wharf, which had been damaged by ice.

The ravages of the teredo below and the natural decay of the wood above the water level, caused the work to settle and become dangerous for traffic, and the sum of \$550 was voted for repairs, during 1902-03.

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When the work was visited to start the repairs, it was found that the inner blocks required to be reconstructed, and that the top of the outer block had been carried away, down to 3 feet below low water, and as the amount voted was entirely too small to reconstruct the whole work the sum of \$513.37 was expended in reconstructing the inner blocks and in procuring a portion of the native timber required, to reconstruct the outer block.

The sum of \$1,400 was voted for expenditure during 1903-04, for the reconstruction of the outer block with creosoted timber piling. The balance of the native timber required was obtained, but owing to the delay in the delivery of the creosoted timber, and the difficulty of procuring a suitable pile-driver, the work could not be started up to the end of June, 1904, and of the amount voted, the sum of \$915.31 only was expended.

During the fiscal year ended June 30, 1905, the sum of \$568.92 was expended in the construction of a wharf on the island, pile-head 26 feet by 48 feet, and of a span 16 feet long and 20 feet wide, to connect the pile-head with the outer end of the old wharf.

The total expenditure to June 30, 1905, is \$4,450.62.

#### JANVRIN'S ISLAND.

Janvrin's island, Richmond county, is a large island to the westward of Madame island, from which it is separated by Mousselier's passage.

The sum of \$2,000 was appropriated for expenditure during 1903-04, towards the construction of a wharf on the island, and as the location had not been selected, an examination had to be made to find the most suitable site for the work. Plan and specification for a native timber block and span wharf on the northern side of Janvrin's harbour, 195 feet in length, 16 feet wide and extending into 8 feet at low water, were prepared, and the necessary materials were contracted for delivery early in the spring of 1904, but as they could not be delivered until after the end of the fiscal year out of the amount voted, the sum of \$24.20 only, was expended, and this was for salary and expenses of the foreman while making arrangements for the delivery of the materials.

During 1904-05, the sum of \$1,974.82 was expended for materials and construction, but work had to be suspended as the appropriation became exhausted.

On suspension of operations all the cribwork blocks were built up to the required height and ready for the floor-stringers, excepting the outer block, which was up to the level of the upper ballast floor, or within 4 feet of the finished top. The shore abutment was nearly completed and the stringers were placed.

Total expenditure to June 30, 1905, is \$1,999.02.

#### JERSEY COVE.

Jersey or Eel Cove, Victoria county, is situated on the north-eastern end of St. Ann's harbour, in the angle formed between the beach at its entrance and the mainland.

On August 19, 1904, instructions were received to prepare plans and specification for a wharf at Jersey Cove, its ultimate cost not to exceed \$4,100, this being the estimated amount as per report submitted to the department on February 13, 1903.

The site surveyed does not suit the majority of the parties interested, and as up to the present time they have not agreed upon a new one, nothing further has been done in the matter up to June 30.

#### JOGGINS.

Joggins, Cumberland county, is a settlement of some 300 or 400 people, situated on the south-east side of Chincto channel, the northern arm of the Bay of Fundy. It is about ten miles from the head of Cumberland basin, and fourteen miles from Maccan



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station on the Intercolonial Railway with which it is connected by the Joggins Railway.

A sum of \$3,000 was appropriated towards the construction of a road leading to wharf, but, up to June 30, 1905, no action had been taken in the matter.

## L'ARDOISE.

L'Ardoise, Richmond county, is situated on the eastern side of St. Peter's bay, near its entrance from the Atlantic ocean, and about nine miles east from the southern entrance to St. Peter's canal.

An isolated breakwater, built off Martin's point, in from 5 feet to 10 feet at low water in 1876-77, and almost destroyed in 1883, was re-constructed during 1891-92-93.

The work consists of a timber core, 400 feet long and 20 feet wide, placed over the remains of the original structure, in from 1 foot to  $4\frac{1}{2}$  feet at low water, its top standing 1 foot above high water; the whole being covered with stone, sloping 3 feet to 1 foot on the seaward side and outer end, and 2 feet to 1 foot on the inner side and inner end. The whole surface of the work, above low water mark, was covered with stone of not less than 15 cubic feet capacity each, and the spaces between the stones above the line of high water, were filled in with concrete.

Since the completion of the work, the covering stones on the seaward and outer end slopes, which had been disturbed by the sea, have been replaced, and a concrete wall, 3 feet wide on top, and  $4\frac{1}{2}$  feet high, with top flush with the surface of the covering, has been constructed over the outer face and the ends of the cribwork core.

The breakwater averages  $17\frac{1}{2}$  feet in height, from the original bottom up to the top of the stone covering, which is 5 feet above high water, and 10 feet above low water springs.

In order to stop the undertow from sweeping into the harbour through the gap, between the inner end of the breakwater and the shore to the eastward of it, a distance of about 1,200 feet, it was decided to close the gap by cribwork.

Plan and specification for the proposed work were prepared and submitted to the department in January, 1902, but the contract for its construction was not entered into until December 29, 1903, in the sum of \$24,880.

The work under contract consists of a cribwork breakwater 1,145 feet long and of a stone embankment, 50 feet long, on top. The cribwork, for a distance of 350 feet from the outer end, is to be 20 feet wide on top and protected by a stone talus on each side; for a distance of 795 feet, it is to be 16 feet wide on top and protected by a stone talus, on the seaward side. The stone embankment is between the outer end of the cribwork and the old breakwater, and is to be constructed with large quarried stone, sloping 3 to 1 on the outer, and 2 to 1 on the inner side.

The work under contract was commenced on July 1, 1904, at the end of the fiscal year the cribwork and the stone embankment were completed and the stone talus was about half placed.

Expenditure during last fiscal year, \$18,853.

P.S.—The work was finally completed and accepted on August 12, 1905.

## LARRY'S RIVER.

Larry's River, Guysborough county, is at the western extremity of Tor bay, on the southern or Atlantic coast of Nova Scotia, twenty-four miles to the westward of Canso harbour.

The harbour, a channel through mud flats improved by dredging, was formerly protected from the eastward by a beach and bar of shingle. Since 1896, the point of the beach at the northern extremity of the bar, and the bar itself, have been lowered and carried inward toward the channel.

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In order to restore the shelter formerly afforded by the beach and bar, a contract was entered into on September 22, 1902, for the construction of a breakwater, for the sum of \$15,840.

The work under contract consisted of two sections of stone embankment, respectively 125 feet and 379 feet in length, each 14 feet in width at the level of 2 feet above high water and 6 feet in average height, and a central section of cribwork 500 feet in length, 14 feet in width on top and 11½ feet in average height, protected on the seaward side by close-fendering and by a talus of stone sloping 2 to 1 from high water. The embankment and cribwork to be finished at a height of 4 feet above extreme high water. Spring tides rise 6½ feet.

In 1902-03, very little work was performed, operations not having been commenced till June 22. In 1903-04, the work was completed with the exception of placing 350 cubic yards of stone in the talus.

The work under contract was completed July 16, 1903, and during the fiscal year 1904-05, the sum of \$1,207.52 was expended in procuring all the materials, with the exception of floor-stringers, required in the construction of a proposed spur on the south-western side and near the outer end of the breakwater, 125 feet in length, to consist of 20 feet of stone embankment and 105 feet of cribwork fully ballasted, close-fendered on the seaward side and around the outer end.

The total expenditure during the last fiscal year amounted to \$3,382.52.

#### LOCKEPORT.

Lockeport is situate on the Atlantic coast about 14 miles south-east of Shelburne and has a population of about 860 people. It has been and is one of the most important centres of the fishing industry on the south coast of Nova Scotia.

During the year 1898-99, the dredge *Canada* performed a large amount of work in this harbour, it was observed that owing to the drifting of sand through the passage between the mainland and a small island, known as Cranberry island, that the channel was filling up and this sand threatened, in a short time, to destroy the usefulness of the centre harbour. In order, therefore, to serve the business interests located in this town, it was considered necessary that this passage, through which the sand drifted, should be closed. In order to do this, the department decided to construct a breakwater across this passage, and during the year 1899-1900, the sum of \$2,948.98 was expended upon this work. In 1900-01, the sum of \$985.06 was expended in completing it, and in 1901-02 the sum of \$299.64 was expended in making necessary repairs, where the sand and water had scoured a portion of the work.

Again the sand scoured, and this last fiscal year an additional sum of \$959.63 was expended in effecting the necessary repairs. A piece 80 feet in length, 10 feet wide and 9 feet high of the cribwork was rebuilt, a rock-bank 120 feet long, 12 feet wide and 3 feet high, or rather the rock-bank to this height, was rebuilt and a heavy layer of brush, stones, &c., was laid for a width of 7 feet on both sides of 160 feet in length of this work. In both cases repairs were made necessary because of insufficiency of brush. The work has been performed in a workmanlike and substantial manner, and there should be but little further trouble with this work for many years, although shifting sand is one of the most difficult conditions to contend with in a matter of this kind.

The breakwater is 1,046 feet long, 8 feet wide on top and about 12 on the bottom, with an average height of 8 feet. For 910 feet of its length it is constructed of substantial stone-filled, long cribwork, the remaining 136 feet consist of a rock-bank situated along its eastern end. Spring tides rise 7 feet; neaps, 5 feet.

#### LONG POINT.

Long Point, Craigmore, Inverness county, is on the eastern shore of George's bay, about 15 miles to the southward from Port Hood, and two miles to the northward of the entrance to the Gut of Canso.

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The point extends out a distance of about 500 feet from the general coast line, and forms a small cove at its southern side, which being partially sheltered from northerly winds, and having a good landing beach, is resorted to by fishing boats in the vicinity in the prosecution of the fisheries.

For the purpose of improving the landing and for the better protection of fishing boats, the sum of \$2,000 was voted for expenditure during 1904-05, towards the construction of a small breakwater off Long Point; and up to June 30, 1905, the sum of \$1,830.96 was expended in procuring the materials required for the construction of a breakwater 200 feet long and 20 feet wide, and in placing the bottom of its inner end, for a distance of 70 feet.

## LINGAN BEACH.

Lingan, or Bridgeport harbour, Cape Breton county, is at the head of Indian bay on the north-east coast of Cape Breton island, about five miles to the eastward of the entrance to Sydney harbour. A large pond or basin, having a depth of 8 feet at low, or 12 feet at high water, is separated from Indian bay by a beach of sand. The entrance, which forms the harbour, was deepened and straightened by dredging in 1878-80, to improve the facilities for shipping coal from the Lingan mines, since abandoned. It is now crossed by a bridge built by the provincial government for the accommodation of traffic over the beach, between Lingan and Bridgeport.

A work of brush and stone 1,900 feet in length, constructed in 1876-78, afforded efficient protection to the beach up to 1893, but has since been carried away in places over distances aggregating 1,400 feet.

In 1901-02, 1902-03 and 1903-04, the sum of \$3,597.54 was expended in reconstructing 1,900 feet of the brush and stone work, in extending it 80 feet, and in constructing a crosswall of brush and stone, 300 feet in length, between it and the bridge.

During the fiscal year 1904-05, the sum of \$999.98 was expended in extending the beach protection work 350 feet to the entrance, and in raising it 1 foot 3 inches over 500 feet, and 2 feet over 300 feet of its length.

The total expenditure to June 30, 1905, exclusive of dredging, amounted to \$8,575.66.

## LITCHFIELD.

Litchfield, Annapolis county, is a fishing and farming settlement with a population (within a radius of about two miles) of about 150 people, situated on the south coast of the Bay of Fundy, ten miles north-east from Digby Gut. In 1904-05, the sum of \$3,000 was expended in constructing a public breakwater for the protection of the fishing fleet. The work, which the appropriation did not suffice to completely finish is 170 feet long, from 20 to 25 feet wide and from 8 to 15 feet high, substantially built of round log cribwork, filled with stone and close-sheathed on the seaward face and outer end. The seaward face is provided with a break 4 feet 6 inches high.

## LITTLE BROOK.

Little Brook, Digby county, is situated on the thickly settled east shore of St. Mary's bay, Bay of Fundy, two and a half miles from Church Point, 33 miles south from Digby, the county town, and 36 miles north of Yarmouth.

Some years prior to confederation a breakwater was built by the inhabitants aided by the provincial government.

In 1873, four blocks of cribwork in the middle of the work were partially destroyed by a gale, and the sum of \$600 from the provincial 'Navigation Securities' was expended in repairs.

In 1891-92, the sum of \$100 was expended by the department in repairing the upper portions of the work which were considerably damaged by an exceptionally high tide

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in the autumn of 1890. A piece 20 feet square by 5 feet deep, was rebuilt, and 100 tons of additional ballast placed in the work.

This breakwater, which is substantially built of stone-filled cribwork of the usual type, is 400 feet long, 20 to 35 feet wide and 20 feet high at the outer end, where there is an 'L' 40 feet long by 25 feet wide. It is much used during the summer months for the shipment of piling, cordwood, lumber and timber, and small quantities of fish, and the landing of general merchandise and supplies for local trade and consumption. Little or no use is made of it in the winter owing to accumulation of ice. At high water of ordinary spring tides, there is a depth of 15 feet of water at the outer end.

At low water, the sand flats for many hundred feet, beyond the end, are bare.

In 1900-01, the sum of \$279.32 was expended in taking down and rebuilding a portion of the outer end, 10 feet wide on top and 20 feet wide at bottom, and in renewing 44 feet in length of the floor with stringers and guards. This work was the repair of damages done by a great storm of March 1, 1900.

In 1904-05, the sum of \$2,000.13 was expended in extending the breakwater by a new block 40 feet long, 31 feet wide and from 20 to 30 feet high. Timber was also purchased for renewals and further extension.

Spring tides rise 21 feet; neaps, 17 feet.

#### LITTLE HARBOUR.

Little Harbour is a straggling settlement whose people are almost entirely employed in the fishing industry. It probably has a population of about 400 people, scattered along about two and a half miles of rough rugged shore. In heavy weather they have but very little protection for their boats and other fishing property; consequently this breakwater was constructed by this department on the eastern side of a small cove or harbour, at the eastern side of what is called Black point, about six miles east of Lockeport.

In 1902-03, the sum of \$1,665.11 was expended upon this work; in 1903-04 a further sum of \$491.08 was expended, and during the last fiscal year an additional sum of \$401.05 was expended making a total of \$2,560.24.

The breakwater is now completed and is a very solid and substantial structure. It is 276 feet in length; consisting of a rock-bank approach 73 feet long, 24 feet wide on top and 8 feet high at the outer end, and a continuous, stone-filled, log cribwork piece 203 feet in length, 20 feet wide and 14 feet high at the outer end. The cribwork is fendered for every 10 feet with two fenders 10 inches at the small end, on each side and is filled to the top with good large size stones. Spring tides rise here 7 feet; neaps  $5\frac{1}{2}$  feet.

#### LITTLE JUDIQUE.

Little Judique harbour, Inverness county, is on the east side of St. George's bay, four miles south of Port Hood, and twenty-two miles north of the northern entrance to the Strait of Canso. The entrance, at the southern extremity of a sand beach, is obstructed by a reef of conglomerate rock, over which there is a depth of only 9 inches, at extreme low water. Spring tides rise 4 feet.

During the fiscal year 1904-05, the sum of \$985.63 was expended in constructing a breakwater of cribwork, 70 feet in length, 14 feet in width on top, and  $9\frac{1}{2}$  feet in average height, in shoal water on the northern side of the entrance.

#### LITTLE NARROWS.

Narrows pond, Inverness county, is on the north side of Little Narrows—a contraction of the St. Patrick's channel, an arm of the Great Bras d'Or lake—at a point eight miles from Whycocomagh.

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During the fiscal year 1904-05, the sum of \$400 was expended in deepening between Narrows pond and Little Narrows to 2 feet at low water in a channel 20 feet in width, and in constructing rough works of brush and stone 230 feet in length, 10 feet in width and from 3 to 4 feet in height on each side.

## LIVINGSTONE'S COVE.

Livingstone's Cove, Antigonish county, is on the south-eastern shore of Northumberland strait, about two miles south-west from Cape George.

For the purpose of affording shelter to the fishing boats of the district, and a landing place for steamers and small vessels, a breakwater was commenced by the department in 1899 and completed in September, 1902.

The work, extending out into 9 feet, at low water springs is 312 feet in length, and is approached by a road cut through the clay bank, 105 feet in length. The breakwater is a continuous structure, consisting of a shore abutment with stone retaining walls, 30 feet long and 18 feet wide, on top; of a cribwork block, 80 feet long and 19 feet wide; and of a cribwork extension, 202 feet long and 24 feet wide, with an 'L' on the southern side of the outer end, 24 by 24 feet. The cribwork is constructed with native squared timber, laid with 7-inch openings, is fully ballasted and fendered, and the northern, or seaward face, the outer end and the southern face of the 'L' are sheathed with hardwood.

It having been ascertained that the teredo was attacking the timber, principally on the seaward face, during 1903-04, the sum of \$1,794.38 was expended in placing a heavy stone talus along its seaward face, out to within 20 feet of the outer end, extending from high water mark with a slope of about 3 to 1.

During the fiscal year ended June 30, 1905, the sum of \$2,211.30 was expended in close-piling with creosoted timber the outer end of the northern face for a distance of 20 feet, the outer end face, the southern end and the back of the 'L' and the southern face of the main structure for a distance of 12 feet from the end. Spring tides rise  $4\frac{1}{2}$  feet.

Total expenditure to June 30, 1905, is \$18,067.71.

## MABOU BRIDGE.

Mabou bridge, Inverness county, crosses Mabou river a little over half a mile above the head of navigation for small vessels.

During the fiscal year 1904-05, the sum of \$998.18 was expended in procuring the materials required in the construction of a pile wharf, 121 feet in length and 20 feet in width, and a cribwork approach, 40 by 40 feet, adjoining the approach to the bridge, on the south side of the channel; in driving half the bearing piles of the wharf and in nearly completing the cribwork approach.

## MAIN-À-DIEU.

Main-à-Dieu is a small harbour on the eastern coast of Cape Breton island, ten miles north of Louisburg.

A breakwater, 230 feet in length, consisting of a cribwork core, fully ballasted and covered with stone sloping on the seaward side and outer end 3 to 1, and on the inner side 2 to 1, was built on the east side of the harbour in 1891-2.

On August 1, 1904, a contract was entered into, in the sum of \$3,925, for the construction of a breakwater on the west side of the harbour, designed to stop the undertow and thus make the anchorage safer, but up to the end of the fiscal year 1904-5 work of construction had not been commenced.

The work under contract is to extend 320 feet in from 6 inches to  $2\frac{1}{2}$  feet at extreme low water. It is to be of cribwork, 14 feet in width on top, fully ballasted, close-

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fendered on the seaward side and protected, on that side, by a talus of stone, sloping 3 to 1, from high water.

Expenditure during last fiscal year, \$296.49.

## MALAGASH.

Malagash is situated at the north-east extremity of Cumberland county on the Northumberland straits.

Appropriation of \$4,000 was made by parliament for the construction of a wharf at this place; plan and specifications were prepared, but up to June 30, 1905, work had not been commenced.

Expenditure, \$10.41.

## MALAGAWATCH.

Malagawatch harbour, Inverness county, is situated on the western side of the entrance of West bay, an arm of the Great Bras d'Or lake.

In 1903-04, the sum of \$299.99 was expended in opening a channel for boats 1,000 feet in length and from 1 to 1½ feet in depth (at ordinary lake level) between the head of the Malagawatch harbour and River Denis basin, and in constructing on each side at the south end, a protection work, of brush, stone and cribwork, 100 feet in length.

During the fiscal year 1904-05 the sum of \$300 was expended in deepening the channel and in constructing protection works at the north end.

## MALIGNANT COVE.

Malignant Cove, Antigonish county, is situated on the south-eastern shore of Northumberland strait, about midway between Arisaig and Georgeville, and distant about four miles from each.

The sum of \$5,000 was voted for expenditure during 1899-1900, towards opening a channel for boats through the gravel beach into a small pond at the head of the cove, and in the construction of channel protection works. A plan and specification for works extending outward to 7 feet, at low water springs, were prepared, and the sum of \$3,893.35 was expended during the year in procuring the materials required for the construction of the channel protection works.

The work proposed included the construction of piers, placed 60 feet apart, on either side of the channel, which was to be excavated to a width of 30 feet in the bottom, and to a depth of 2 feet below low water. The piers extending 248 feet inwards, through the beach, from low water outside, to be 10 feet wide on top, and founded at low water; those extending from low water outwards, to be 16 feet wide for a distance of 60 feet, and 22 feet wide for a distance of 30 feet. All cribwork was to be built of round native timber, laid open-faced, fully ballasted, and close-sheathed at the ends and on the channel faces, the sheathing on the channel faces of the work through the beach to be driven into the beach to a depth of 4 feet below low water mark.

In 1900-01, the sum of \$6,123.64 was expended in the construction of the outer piers, each 90 feet in length, and of a portion of the inner pier, on the eastern side of the channel, 188 feet in length.

During 1901-02, the work proposed was completed, and a cribwork extension to the western inner pier, 60 feet long and 10 feet wide, was constructed to prevent the re-opening of the channel through the beach; the expenditure incurred amounted to \$2,464.85.

In the year 1902-03, the inner end of the western pier, which for a distance of 70 feet was built lower than the outer portion, was raised to the same level, a height of 2 feet, and planked over; beach protection works, consisting of a cribwork block 40 feet long, 12 feet wide, and averaging 10 feet in height, and of an extension of piles, brush and stone 50 feet long, were constructed on the eastern side of the eastern pier, to pre-



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vent the sea from washing over the beach and carrying sand into the channel, between the piers. The amount expended during the year was \$799.94.

During the fiscal year ended June 30, 1904, the sum of \$1,099.07 was expended in close-piling the outer ends of the piers, and their faces for a distance of 20 feet from the ends, with hardwood piling; in replacing ballast washed out of ends of piers and in extending the beach protection work on the eastern side of the eastern pier for a distance of 40 feet with cribwork.

The amount voted for expenditure during 1904-05, viz.: \$2,800, was intended for close-piling, with creosoted timber, the outer ends of the channel piers, which had been weakened by the teredo. The necessary materials were procured, but before the delivery of the creosoted timber, it was found necessary to extend the beach protection work on the eastern side of the eastern pier, at a cost of about \$500, and the remaining balance of the appropriation proved insufficient to drive all the piles as intended. The faces of the piers were prepared to receive the piles, by placing three walings on them, and of the 120 piles to be driven, 35 were placed and secured on the eastern face and outer end of the eastern pier. The expenditure amounted to \$2,813.95.

Total expenditure on this work up to June 30, 1905, is \$17,194.80.

## MARGAREE HARBOUR.

Margaree harbour, at the mouth of Margaree river, Inverness county, is on the west coast of Cape Breton island, about thirty miles north-east of Port Hood. It has a narrow intricate channel through which the tide runs at the rate of four knots and its entrance is obstructed by a bar of shifting sand, over which there is, at times, a depth of only 5 feet at extreme low water.

Expenditures have been made by the department in the construction and maintenance of channel protection and improvement works on the west side of the entrance, and in the construction of beach protection work on the east side.

The works on the west side include works built by the provincial government and extended by the department, and works of improvement undertaken in 1900-01.

The old provincial government works (reconstructed by the department) extended 400 feet from the shore, across what was originally a false channel, to a large rock opposite the inner entrance, and thence, at right angles, to the edge of the channel.

The work built by the department extends from the north side of the outer provincial government works outward, along the west side of the channel 595 feet. It is in four sections: 85 feet (built in 1876), 130 feet (built in 1879), 200 feet (built in 1890), and 180 feet (built in 1899), respectively 18, 16, 18 and 20 feet in width on top, and 15, 14, 12 and 16 feet in height. Each section is of round timber, open-faced and fully ballasted and close-fendered at the sides and outer ends. The top of the covering is from 4 feet 4 inches to 5 feet above extreme high water. The depth, at extreme low water, along the channel face, originally varied from 7 to 2½ feet. Spring tides rise 4 feet.

The improvements undertaken in 1900-01, but not completed, were the deepening along the channel face of the extension to 8 feet at low water, over a distance of 200 feet; and the construction of a shear-dam within the entrance, 180 feet in length, including 25 feet of brush and stone work 11 feet wide on top, 100 feet of pile and brush work 10 feet wide, and 55 feet of cribwork 22 feet wide founded on brush work in from 1 foot 3 inches to 9 feet 9 inches at extreme low water. During the year 1900-01, the sum of \$3,695.30 was expended, \$400 in repairing the channel face of the outer provincial government work; \$1,796 in procuring materials and constructing the brush and stone work, the pile and brush work, and the substructure of the cribwork of the shear-dam; and \$1,499.30 in about one-half of the rock excavation required to give 8 feet at low water, along the channel face of the extension.

In 1901-02, the sum of \$3,065.57 was expended, \$995.78 in completing the shear-dam, and \$2,069.79 in continuing the submarine rock excavation.

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Of the \$500 appropriated for 1902-03, the sum of \$482.32 was expended ; \$219.41 in completing the shear-dam; \$61.82 in continuing the channel, face rock excavation ; and \$201.09 in repairing and improving the channel protection works.

In 1903-04, the sum of \$799.94 was expended in continuing the channel face rock excavation undertaken in 1900-01.

Of the amount appropriated for 1904-05, the sum of \$999.64 was expended ; \$969.79 in August and September in continuing the submarine rock excavation along the channel face of the pier in progress in 1900-01, 1901-2 and 1903-4, and \$29.90 in September and October in re-ballasting some face chambers at the outer end of the pier. An additional sum of \$248.32 was expended in November and December, 1904, and April, 1905, in re-ballasting and repairing the covering at the outer end, and over a distance of 45 feet near the centre of the pier.

The total expenditure to June 30, 1905, including \$3,378 expended in beach protection works (east side) and a refund of \$274.87 to the provincial government, is \$30,-075.66.

#### MARGARETVILLE.

Margaretville, Annapolis county, is the most important village on the south coast of the Bay of Fundy between Digby gut and Scott's bay; it is forty-two miles north-east from the former, thirty-six miles south-west from the latter, and nine miles north from Middleton, an important station on the Dominion Atlantic railway. It has a population of about 500 people engaged in fishing and farming.

A pier was begun in 1837, by the provincial government and subsequently extended to a length of 471 feet. The work was taken over by the Public Works Department in 1871, since which time it has had frequent renewals and repairs. In December, 1885, the pier was severely damaged by a storm, a breach nearly 150 feet long being made clear through it, besides receiving other injuries. The Margaretville Pier Company transferred their title to the pier to the government on August 3, 1886. In 1886-87, the above described damage was made good. In October, 1890, a severe gale made a breach of 117 feet in the outer portion of the work, besides doing other damage. In March, 1894, the remaining block, 86 feet in length seawards from the 117 foot gap, was totally destroyed. In 1897-99 the outer block was rebuilt. This new block, which is substantially built of round-log cribwork, close-sheathed on the seaward face and outer end, is 185 feet long, 42 feet wide and from 22 to 23 feet high. In 1900-01, the sum of \$500 was expended in renewing the floor on the shoreward end of the work and in other miscellaneous repairs.

In 1902-03, the sum of \$768.21 was expended in sheathing the seaward face of the breakwater for a length of 155 feet on the shore end, and in removing gravel from the eastern or land side to improve the schooner berth. Also the sum of \$1,550.50 was expended in constructing a new breakwater 250 feet to the eastward of the main work. The new breakwater is 110 feet long, 16 feet wide and 7 feet high at the shore end, 25 feet wide and 16½ feet high at the outer end. The work is substantially built of round-log cribwork, well fendered, bolted and filled with ballast.

In 1903-04, the sum of \$500 was expended in building a short piece on the shore end of the main or west breakwater, 14 feet long, 25 feet wide and 8 feet high, also in constructing a small inner block on the east side of the shore end 22 feet long, 7 feet wide and 8 feet high. A few petty and miscellaneous repairs were made to the flooring of the breakwater.

In 1904-05, the sum of \$1,986.06 was expended in extending the eastern breakwater. The new block is 90 feet long, 27 to 30 feet wide and when completed, will be 17 feet high at the inner and 26 feet high at the outer end. At the end of the fiscal year the new work was built to within 7 feet of its finished height. The sum of \$600 was also expended in sheathing a portion of the outer end of the breakwater with creosoted 6-inch planks, as a protection against the ravages of the limnoria.

Spring tides rise about 30 feet.



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## MCKAY'S POINT.

McKay's Point, Victoria county, is on the western side of the entrance into St. Patrick's channel, an arm of the Bras d'Or lake, and about two and a half miles, by water, from Baddeck, the shiretown of the county.

The steamer *Blue Hill*, carrying mails, freight and passengers, makes, during the season of navigation, two return trips daily between Baddeck and Iona station, on the Intercolonial railway, and as McKay's Point is on her course, in order to place the inhabitants of the district in direct communication with these places, on April 30, 1904, a contract was entered into, in the sum of \$5,442 for the construction of a wharf, extending to 12 feet at low water.

The work was commenced on September 15, and was completed on December 2, following.

The wharf is a block and span structure, 206 feet in length and 20 feet wide, with an 'L' on the western side of the outer end, 20 by 20 feet, and is composed of a shore abutment 28 feet long; of four cribwork blocks, 17 feet long; and of an outer block 20 by 40 feet, with openings between them, 18 feet long. The blocks are constructed of round timber, laid open-faced and creosoted to high water, lake level, fully ballasted and fendered. The outer faces of the outer block are close-sheathed, as a protection against ice.

Expenditure during last fiscal year, \$5,637.30.

## MCNAIR'S COVE.

McNair's Cove, Antigonish county, is on the west side of St. George's bay, about two miles to the southward of Cape George.

A breakwater, 400 feet in length and 20 feet in width, was built on the north side of the cove during 1872-73-74, and in 1878, a length of 20 feet was added thereto. In 1879, the work was carried away by drift ice to within 100 feet of the shore end, down to from 3 to 6 feet below low water.

During the summer of 1883, 70 feet of the shore end was rebuilt, and during the winter of 1884, the work was extended 94 feet. In April, 1884, the 94 feet extension was badly damaged by drift ice, and was subsequently carried away.

During 1886-87-88, the bottom of the damaged work was dredged out, and a work 160 feet in length, 34 feet wide on top, with a sloping face on the seaward side, was constructed; on its completion the total length of the breakwater was 330 feet.

The work was constructed entirely of native timber, and as it became much weakened by the action of the teredo, during 1890-91-92-93-94, the outer end, and on each side of it for a distance of 20 feet, was protected by creosoted timber close-piling, and its seaward face, by a talus of quarried stone.

During the years from 1897 to 1901, the timber wall under the sloping face, which was destroyed by the teredo, was reconstructed down to low water and close-sheathed with hardwood timber, the stone talus was raised up to the top of the close-sheathing, and the work was re-ballasted and re-covered where necessary. Further, the mouth of a small brook, at the head of the cove, which was continually shifting to the detriment of the boat landing, was made permanent by the construction of a shear dam of brush and stone.

During 1901-02, the sum of \$1,197.17 was expended in placing 80 cubic yards of very large stone on the talus, and in procuring the materials required for the widening, and renewing the top of the inner end of the work, which was built in 1872, and was only 20 feet wide.

In the year 1902-03, the amount of \$1,094.58 was expended in reconstructing the top of the inner end of the work, and in widening it, for a distance of 120 feet, and to a width of 30 feet, the materials for which were obtained in the previous year; and in placing about 85 cubic yards of large stone on the talus, along the seaward face of the work.

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The sum of \$6,000 was voted for expenditure during 1903-04, towards the construction of a new end and 'L' with creosoted timber substructure, 32 feet wide and 80 feet in length, but owing to delay in the delivery of the creosoted timber, up to June 30, 1904, the work of construction had not been commenced. Out of the amount voted, however, the sum of \$4,737.72 was expended for materials.

The sum of \$5,221.09 was expended during 1904-05, in the construction of the extension, and in the renewal of floor-stringers, covering and cap on the outer end of the old work, for a distance of 50 feet.

The extension is 80 feet long and 32 feet wide, and is constructed of round timber, laid open-faced, with ties of round timber, creosoted to half tide, is fully ballasted and fendered, and is protected on all seaward faces with close-sheathing.

Spring tides rise 4 feet.

Total expenditure to June 30, 1905, is \$78,316.13.

#### MELBOURNE.

Melbourne, Yarmouth county, is a settlement of some twenty or thirty families, engaged in fishing and farming, situated on the east side of the estuary of the Chebogue river, about eight miles N.N.E. from the town of Yarmouth.

In 1903-04, the department expended the sum of \$715.12 in constructing a block-and-span wharf, 100 feet long and 25 feet wide, comprising three blocks of substantially built cribwork, each 25 feet wide, 9 feet long and from 12 to 15 feet high. Two spans of 12 feet each and an approach of earth and gravel, walled up with large stone on either side.

In 1904-05, the sum of \$25.38 was expended in placing a crane on the outer end of the wharf for the purpose of aiding the unloading of sea manure, &c., from boats.

Spring tides rise about 12 feet; neaps, about 10 feet.

#### METEGHAN.

Meteghan, Digby county, is situated on the south side of St. Mary's bay, twenty-five miles north of Yarmouth, twenty miles south of Weymouth, two and a half miles from Meteghan river, forty miles from Digby, the county town. The nearest railway station on the Dominion Atlantic railway, which lies approximately parallel from the coast and has its terminus at Yarmouth, is about seven miles distant. The whole coast of St. Mary's bay, from Digby to Yarmouth, is thickly settled, and is, in fact, almost one continuous straggling village for the whole distance of sixty-seven miles.

Meteghan, next to Digby and Yarmouth, is the largest and most important settlement on the bay shore, having a population of 1,000 people engaged in farming, fishing, lumbering and general trade.

The harbour works consist of a breakwater and landing pier, built of cribwork between 1837 and 1860, by the provincial government and the inhabitants. The pier is about 300 feet long and 20 feet wide; the breakwater 20 to 26 feet wide, runs out a distance of 925 feet from the shore, and has a return or 'L' of 85 feet at the outer end, which is 24 feet wide and 30 feet high, standing in from 25 to 27 feet depth at H.W. O.S.T.

In 1875, at which date the work appears to have been taken over by the department, the breakwater was extended and repaired.

In 1878, an additional length of 100 feet was built with a portion of the 'L' at the outer end at a cost of \$3,000 and in 1881, the sum of \$2,250 was expended in still further extending the structure by building an additional length of 50 feet on the 'L.' In 1882-83, the sum of \$500 was expended in re-ballasting and close-piling portions of the work and in miscellaneous repairs. In 1883-84, \$32 was expended in securing some of the fenders and a portion of the flooring at the outer end. In 1884-85, the damage caused by a severe gale of the previous November was made good at a cost of \$96.64; a

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breach 25 feet long and from 4 to 6 feet deep was closed with solid work; 40 feet of new break was added and some new ballast put in to replace that washed out. In 1887-88, the seaward face of the breakwater was close-sheathed for 700 feet in length; 575 feet of the inner face was repaired and sheathed, the whole work levelled up and some minor repairs executed; the expenditure in this year was \$1,447.33, which in the departmental report for the year, is given as a refund to the provincial government on account of moneys expended by them between 1867 and 1879. In 1892-93, the department expended the sum of \$299.72 in making slight repairs to the breakwater and in temporary repairs to the landing there. In 1893-94, the sum of \$2,627.54 was expended in making thorough repairs to the landing pier and wharf, the work done consisting of rebuilding and face fendering the outer block, 50 feet in length, building a new top and back 8 feet thick to the next length of 16 feet and thoroughly refendering and capping the remainder of the work, a length of 260 feet.

In 1897-98, the sum of \$3,141.99, was expended in constructing a re-enforcing block along the whole length of the outer face of the 'L' of the main breakwater. This work, which was rendered necessary by the eating away of the bottom timbers by the limnoria, and the consequent settlement of the breakwater, is 100 feet long, 12 feet wide and 4 feet high. The upper portion of the 'L' was also built 35 feet wide, and 4 feet high, which restored it to the height of the present work. The new work is well and substantially built of round-log cribwork, well fendered, ballasted and close-sheathed on all exterior faces. In 1898-99, the sum of \$1,093.20 was expended in renewing a length of 120 feet by 8 to 10 feet in height, and by 8 to 10 feet in width of the lower portion of the outward end of the seaward face of the breakwater, which had been eaten away by the limnoria; the work close-sheathed for the same distance and for 40 feet on the inner side; about 10 feet in length of the flooring was renewed; a breach 30 feet long on the seaward side, adjacent shoreward to the 120 feet before mentioned was also closed up.

In the fiscal year 1899-1900, the sum of \$2,000 was expended in extensive renewals and repairs to the breakwater, the work done consisting of the rebuilding of 100 feet in length of seaward face and 90 feet of the inner or shoreward face, about 8 feet wide from top to bottom of the work, placing top cross-logs all across the breakwater to tie the new portions together and new floor on the portions renewed.

In 1900-01, the sum of \$3,499.95 was expended in rebuilding a serious breach made in the work by a severe gale in March, 1900. The new block, which had to be built from the bottom, is 180 feet long, 22 feet wide and from 18 to 22 feet high. In addition to this a length of 222 feet of the top of the breakwater was refloored and partly close-sheathed, the floor having been destroyed by the storm referred to.

In 1901-02, the sum of \$3,199.93 was expended in continuing the restoration of the breakwater that had been going on for the last three or four years. The work done consists of a piece 138 feet long, in about the middle of the length of the wharf, being taken down and rebuilt. Of the next 200 feet shorewards, the northern face was taken down and rebuilt 10 feet wide.

In 1902-03, the sum of \$2,997.47 was expended in completing the rebuilding of a piece in the middle of the breakwater, 123 feet long, 20 feet wide on top and from 9 to 11 feet high, that had been destroyed by a violent gale in the winter of 1901-02.

In 1903-04, the sum of \$2,300 was expended in continuing the reconstruction of the work, carried on during the past two years. The work done this year consists of the taking down and rebuilding of 80 feet in length of the shore end of the work.

In 1904-05, the sum of \$2,000 was expended in further restorations; the work done consisting of the completion of the 80 feet block, near the shore that was partially rebuilt last year; the taking down and rebuilding of a further length of 102 feet and on the south side of the extreme shore end, the restoration of a length of 100 feet and the construction of a break to keep the gravel from washing into the berth alongside.

The total expenditure to June 30, 1905, is \$40,749.85 including a refund to the provincial government of \$1,447.33 in 1887-88.

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The work was transferred to the control of the Department of Marine and Fisheries, June 12, 1888.

Spring tides rise 21 feet; neaps, 17 feet.

#### METEGHAN RIVER.

Meteghan River, Digby county, empties into the Bay of Fundy, at the mouth of St. Mary's bay, almost directly opposite Grand Passage between Long island and Brier island. The village at the mouth of the river is twenty miles south of Weymouth, twenty-eight miles north of Yarmouth and two and a half miles north of Meteghan or Meteghan Cove. The population of the village is about 400 people engaged in farming, fishing, lumbering and general trade. The nearest railway station, on the Dominion Atlantic railway, which runs parallel with the bay shore, is about four miles from the village. On the river, which is about eighteen miles long, are some twenty saw mills, most of which send lumber down to the mouth of the river for export to the West Indies and the United States, the total amount of the output aggregating over a million feet b.m. annually. The works here, which were built some years before confederation, presumably at the joint expense of the provincial government and the inhabitants, consist of two breakwaters, one on either side of the river mouth, and inclosing an area of about three acres, in which, at H.W.O.S.T., is a depth of 10 to 15 feet giving ample berth accommodation and complete shelter to a large number of coasting and fishing vessels.

The north breakwater is about 400 feet long, 25 feet wide and 13 feet high at the outer end. Both breakwaters are built of stone-filled cribwork of the usual type. When the work came under the charge of the department, the older portions were much decayed, and extensive repairs were needed, which were made in 1873, at a cost of \$4,500. In 1881-82, the sum of \$2,000 was expended in rebuilding and repairing parts of both breakwaters. In 1882-83, the sum of \$3,000 was expended in close-piling and extending the south breakwater a length of 80 feet, in general repairs to the north breakwater, and in removing from the dock a large quantity of rocks and boulders which were used as ballast in the new work. In 1890-91, \$265.19 was expended in removing from the channel, near the shore end of the work, more rocks and boulders, that interfered with the keels of vessels lying alongside; slight repairs were also made under the same appropriation to both breakwaters. In 1898-99, the sum of \$4,110.76 was expended in extensive renewals to the shore end of the south breakwater; the work taken down and rebuilt was 400 feet long, with an average width of 29 feet and an average height of 19 feet. This length was newly close-sheathed, and on the shoreward side of the same portion a new break was built, 276 feet long and 6 feet high. In the fiscal year 1899-1900, the sum of \$4,199.98 was expended in continuing the work of restoration of the main breakwater, a length of 216 feet of the shore end of the work, adjoining outwardly the portion of the work renewed the previous year, was taken down and rebuilt.

In 1900-01, the sum of \$8,848.55 was expended in continuing the restoration of this work begun in 1888-89, and in removing gravel from the bottom of the stream between the two breakwaters; 184 feet in length was taken down and rebuilt from the bottom, an average width of 27 feet and from 18 to 19½ feet high. The next 213 feet shorewards rebuilt the previous year, was new floored, including stringers, caps and planks.

In 1901-02, the sum of \$3,999.99 was expended in continuing the work of restoration begun in 1898-99. The outer 113 feet of the work was rebuilt practically entire. In order to straighten the outer block of the work, it was widened 24 feet at the outer end, the new block tapering to nothing 83 feet shorewards from the outer end; 83 feet in length also of the outer end of the work was close-piled on the north side to protect it against scour by the river which issues at this side. A considerable quantity of gravel was also removed from the river channel to improve the approach to the wharfs.

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In 1902-03, the sum of \$942.41 was expended in completing repairs and renewals to the breakwater in progress during the past two seasons. The work done included the renewal of the upper portion of the outer end of the breakwater and in deepening the river channel alongside the outer end of the work.

In 1903-04, the sum of \$300 was expended in protecting with close-piling a length of 73 feet on the eastern side of the breakwater that was undermined by ice and waves during the previous winter.

In 1904-05, the sum of \$333.16 was expended in close-piling a portion of the shoreward face of the breakwater to protect it from scour.

The total expenditure to June 30, 1905, is \$37,730.73.

This work was transferred to the control of the Marine and Fisheries Department on June 12, 1888.

Spring tides rise 21 feet; neaps, 17 feet.

## MIDDLE EAST PUBNICO.

Middle East Pubnico, Yarmouth county, is a thrifty settlement of some 400 or 500 people engaged in fishing and farming, situated on the east side of Pubnico harbour, thirty-two miles south from the town of Yarmouth.

In 1904-05, the sum of \$3,531.67 was expended in constructing a public wharf of pile-work, 250 feet long, 25 feet wide with an 'L' on the outer end, giving a face length of 50 feet and a height of 16 feet. At H.W.O.S.T., the face of the work carries a depth of about 13 feet of water.

Spring tides side about 14 feet.

## MIDDLE RIVER.

Middle river, Victoria county, is a large stream emptying into Indian bay, on the northern shore of St. Patrick's channel, an arm of the Little Bras d'Or lake.

About five miles from its mouth, the river flows through alluvial lands, easily acted upon by the strong currents during freshets, and in consequence a large area of valuable land has been destroyed.

During 1903-04, the sum of \$1,405.35 was expended in procuring the materials required for the construction of a shear dam, 600 feet long and 15 feet wide, and built with piles, brush and stone, sheathed on the outside, for the purpose of diverting the stream into an old river bed, and to straighten its course. Besides procuring the necessary materials, about 200 feet of the dam was completed and sheathed on the upper side, during the year, but the interior of the work was only partly filled with the brush and stone.

During the fiscal year ended June 30, 1905, the dam was completed in accordance with plan and specification, and the amount expended is \$999.87.

The sheathed dam has proved effective as the river flows now through the old bed, and the danger of its destroying valuable lands has been greatly lessened.

Total expenditure on this work up to June 30, 1905, is \$2,405.22.

## MONK'S HEAD.

Monk's Head, Antigonish county, is on the southern shore of St. George's bay, between the harbours of Antigonish and Pomquet. A large sheet of water to the westward of Monk's Head, known as Dunn's lake, is separated from the bay by a beach of shingle, and from Antigonish harbour by a neck of marsh land.

In 1894 and 1895, a channel for boats was opened between Dunn's lake and Antigonish harbour, and a high-way bridge was built over its western entrance. Subsequently the bridge and its abutments were re-constructed and protection works of brush, stone and piles were constructed, extending from the bridge inwards, on the northern

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side 215 feet and on the southern side 240 feet. The channel is 700 feet in length and has a minimum depth of 1 foot at extreme low water, spring tides rise 4 feet.

During the fiscal year 1904-05, the sum of \$179.78 was expended in repairs to the bridge, including removing and replacing the superstructure and reconstructing the faces of the brush and stone abutments.

#### MORDEN.

Morden, King's county, formerly called French Cross, is a small fishing and farming village of about 150 people, situated on the south shore of the Bay of Fundy, fifty miles north-east of Digby Gut and nine miles north from Alesford station, on the Dominion Atlantic railway.

The pier or breakwater which is the most westerly in King's county, was begun in 1846, at the joint expense of the inhabitants and the provincial government. It is built of round-log cribwork, filled with ballast, close-sheathed on the seaward side and outer end. It is about 365 feet in length, and varies in width from 28 feet at the shore end to 45 feet at the outer end, where it is 26 feet in height. It has had many repairs, renewals and extensions of which the following are the most important.

In 1896-97-98, 120 feet in length of the middle of the work, which was totally destroyed by a violent gale in February and October, 1895, was thoroughly rebuilt. In 1898-99, this gap was completed, other important repairs effected and an accumulation of gravel removed from the inner side of the breakwater. In 1899-1900, 68 feet in length of the buttress on the seaward face of the work was rebuilt from the bottom to the full height of the breakwater.

In November, 1899, a severe gale, accompanied by exceptionally high seas broke over the work and destroyed 75 feet in length of the inner or shoreward side of the breakwater, immediately abreast of the part of the seaward face renewed the previous year. In November, 1900, another severe gale destroyed 22 feet in length of the outer end of the work, which was old and much decayed. In 1900-01, the sum of \$3,829.89 was expended in rebuilding the 75 feet of the eastern or shoreward side of the breakwater, which was destroyed in November, 1899, and in beginning the construction of an extension 50 feet long to replace and supplement the 22 foot length of the outer end of the work which was destroyed in November, 1900.

In 1901-02, the sum of \$1,495.10 was expended in completing the extension of the breakwater begun the previous year. The new block is 50 feet long, 44 feet wide where it joins the old work and 30 feet at the outer end. It is of uniform height of 26 feet well built of round-log cribwork, sheathed on the seaward face, along which there is a break 6 feet high and filled solid with ballast.

In 1904-05, the sum of \$49.99 was expended in removing a quantity of gravel that had washed around the outer end of the breakwater, obstructing the entrance of schooners.

#### NEIL'S HARBOUR.

Neil's Harbour, Victoria county, is situated on the eastern coast of Cape Breton island, about midway between Ingonish and Aspy bays.

The harbour is at the entrance of a small bay, open to the south and south-east, extending inland about half a mile. It is sheltered from the north and east by Neil's Head, a rocky promontory from 10 to 20 feet above the level of high water springs, but not safe during gales from the south and south-east.

It is a large and important fishing station, and for the purpose of affording protection to the anchorage during south-easterly gales, on May 29, 1901, a contract was entered into for the construction of a breakwater off the southern end of Neil's Head, extending into 17 feet at low water, and the work was completed in a satisfactory manner on May 29, 1903.



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The work included a breakwater 226 feet in length, and a road cutting through the bank 79 feet long and 20 feet wide at the bottom. The breakwater, excepting the inner end for a distance of 44 feet, which is of round native timber cribwork, consists of close-faced squared timber work, 20 feet wide for a distance of 114 feet from the inner end, 24 feet wide for a further distance of 80 feet, and 56 feet wide for the remaining 32 feet. The work is very strongly constructed, filled in solid with ballast, and close-sheathed on the seaward faces, the outer end, and on the inner face for a distance of 112 feet from the outer end. The substructure is of creosoted timber, and the seaward side is protected by a stone talus.

During the fiscal year ended June 30, 1905, the sum of \$952.79 was expended in the removal of rocks and boulders off the beach inside the breakwater, which interfered with the landing of boats, and in placing the stone removed on the seaward side of the breakwater.

The total expenditure on this work is \$18,302.73.

Spring tides rise 4 feet.

## NEW CAMPBELLTON.

New Campbellton, Victoria county, is at the head of Kelly's cove, on the northern side of the Great Bras d'Or channel, about one mile from its entrance into the Atlantic ocean.

The cove is about half a mile in width at the mouth, and a quarter of a mile in depth, and has a depth of water of about 20 feet at low water. It is sheltered from all winds, except south-westerly, but as these blow down the channel, they do not cause much inconvenience.

It is the shipping place of the Cape Breton Coal Mining Company, and a considerable amount of coal is shipped from here annually. Owing to the want of a proper and permanent ballast ground, the ballast is often deposited by vessels where most convenient to them, without due regard to the damaging effects and in consequence the depth of water in the cove is said to have been reduced.

The sum of \$5,000 was voted for expenditure during 1902-03, towards the construction of a ballast wharf. Plan and specification for a work estimated to cost \$11,000 were submitted to the department on December 17, 1902, but the work was not let.

On April 26, 1904, instructions were received to prepare a new plan and specification for the proposed ballast wharf, to include the repairing of the shipping wharf, but owing to other pressing work on hand the plan and specification could not be submitted until March 3, 1905. In the latter part of April, tenders were asked for the construction of the works, but up to the end of the fiscal year, the contract for their execution was not awarded.

Expenditure during last fiscal year, \$182.46.

## NEWELLTON.

Newellton is situated about two miles north-west of Clark's Harbour, and has a population of about 400.

A wharf was constructed at this place in the fiscal year 1899-1900, with a view of affording adequate facilities for the landing of goods required by the residents, and likewise to accommodate several small steamers, which ply along this coast and which in the past were unable to land passengers and freight without serious discomfort and difficulty. It formerly consisted of a substantial rock-bank approach 108 feet in length, 30 feet in width with a height at the outer end of 8 feet, supplemented by two stone-filled cribwork blocks, each 19 feet in length, separated by a span of 11 feet, and seven pile trestle bents, separated from each other 10 feet centre to centre of pile-heads. The width of the pile and cribwork was 20 feet with a height, at the outer end, of 23

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feet. In the fiscal year 1901-02, the sum of \$390.59 was expended in repairing and sheathing this work; in 1903-04 an additional sum of \$235.21 was expended in close-piling, the sheathing having not been able to stand the heavy seas.

During the last fiscal year the sum of \$836.56 was expended in constructing an extension 30 feet long, 40 feet wide, and 25 feet high, at the outer end. It is built of pile trestle-bents, situated 10 feet apart from centre to centre, well fendered, braced, waled and fastened.

Spring tides rise 9 feet; neaps, 6½ feet.

## NEWPORT LANDING.

Newport Landing, Hants county, is situated on the east bank of the Avon river, about two miles below the town of Windsor, on an isolated neck of land between the St. Croix river, on the south, and the Kennetcook on the north, the distance by land to Windsor being fourteen miles. The nearest railway station is Brooklyn, on the Midland railway, about six miles distant. It is a rich agricultural district with a population of about 500 people. Most of the trade of the place is carried on with the town of Windsor by water.

In 1904-05, the sum of \$1,685.74 was expended in purchasing the necessary timber, and in commencing the construction of a public wharf. The work, as designed, will be 240 feet long, 35 feet wide and at the outer end 20 feet high. Spring tides rise about 40 feet.

## NOEL.

Noel, Hants county, has a population of about 500 and is situated on the south shore of Cobequid bay, the extreme eastern arm of the Bay of Fundy. It is thirteen miles west of Maitland, and thirty-two miles north-west of Shubenacadie, the nearest railway station on the Intercolonial railway. It is, at this date, almost exclusively a farming district; the export of lumber and timber, and the building of wooden ships which some years ago were important industries, having practically ceased.

In 1889, a public wharf was built by the department, by day labour. It consists of first, 35 feet in length of brush and stone causeway approach; next a 30-foot block of cribwork, close-faced and filled to the top with gravel and stone; then, 203 feet in length of pile work, 25 feet wide on top, with a double row of close-piling on the exposed or northern side, and an 'L' at the outer end, with a face-piling length of 62 feet. Along the outer face of the 'L,' the work is 24 feet high, having a depth of water at H.W.O.S.T., of 21 feet.

In 1900-01, the sum of \$60.15 was expended in renewing the planking of the outer end of the wharf.

In 1904-05, the sum of \$1,006.50 was expended in thorough renewals and repairs to the top of the wharf, including floor planking, new stringers and guard timbers, close-piling and fender piles. The work was completed at the close of the fiscal year.

The total expenditure to June 30, 1905, is \$4,351.92. The work was transferred to the control of Department of Marine and Fisheries on October 5, 1898.

Spring tides rise 50½ feet; neaps, 43½ feet.

## NORTH GUT ST. ANN'S.

North Gut St. Ann's, Victoria county, is the local name of the north-western arm of the head of St. Ann's harbour, a fine basin seven miles in length and two miles wide, situated at the head of St. Ann's bay, on the eastern coast of the island of Cape Breton.

On September 29, 1904, a contract was entered into for the construction of a wharf at Morrison's Point, in the sum of \$1,850, and the work was completed on May 31, 1905.



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The wharf is a block and span structure, 122½ feet long and 20 feet wide, with an 'L' at the outer end, 20 by 20 feet extending to 7½ feet at low water; it is constructed entirely of round native timber, laid open-faced, properly ballasted and fendered.

Expenditure during last fiscal year, \$1,991.38.

## NORTH RIVER.

North River, Victoria county, empties into the northern arm of St. Ann's harbour, a commodious basin seven miles long and about two miles wide, with a great depth of water, at the head of St. Ann's bay, on the eastern coast of Cape Breton island.

The wharf constructed by the department at Seymour's Point, on the northern side of the mouth of North river, during 1898-1899-1900, extends to 9 feet at low water, and consists of a road approach 64 feet long and 16 feet wide; of a block and span work 63 feet long and 20 feet wide; and of a pile-extension 175 feet in length and 20 feet wide, with a return of 20 feet at its outer end.

All the bearing and mooring piles in the pile-work were to be of creosoted timber, excepting the piles in the three inner bents, which being driven above the level of low water and considered safe from the attacks of the teredo, were to be of spruce; but as there was a shortage of creosoted piling in the cargo received, and none could be obtained in the island, the contractors were permitted to substitute native timber piling for three bents at the inner end, and the difference in cost was deducted from the contract price.

An examination of the wharf, made on January 27, 1903, showed that some of the native timber bearing piles had been cut into by the teredo, and that the rest were much weakened and in order to make the wharf safe for traffic until it could be properly repaired, the sum of \$45.88 was expended during the fiscal year 1902-03, in placing posts under the pile-caps in the six inner bents of the pile-work, to take the strain off the damaged piles.

The sum of \$900 was voted for expenditure during the last fiscal year, in replacing the native timber bearing piles, with creosoted timber, and in renewing the hardwood fender piles. All the necessary materials were obtained and delivered but owing to the difficulty of obtaining a suitable pile-driver the work was not completed by the end of the fiscal year, and out of the amount voted, the sum of \$689.68 only, was expended.

During the fiscal year 1904-05, the sum of \$313.40 was expended in placing and securing the fender and bearing piles which were procured during 1903-04.

Spring tides rise 6 feet.

The total amount expended on this work to June 30, 1905, is \$3,412.15.

## OGDEN'S POND.

Ogden's pond, Antigonish county, is on the western shore of St. George's bay, about thirteen miles south from Cape George, and nine miles north from the town of Antigonish. It is a small sheet of water, about 100 acres in extent, separated from the bay by a sand beach of from 130 to 250 feet in width.

For the purpose of rendering the pond, which has a depth of over 10 feet at low water, accessible to boat and small craft, during 1900-01-02, a channel 30 feet wide and 825 feet long, was cut through the beach and the flat inside, down to a depth of about 1½ feet below low water, and a channel protection work, 350 feet in length was constructed on the northern side of the entrance. The work consisted of: a brush and stone embankment 70 feet long and 8 feet wide on top, with side sloping ½ to 1; a pile, brush and stone work, 260 feet long and 10 feet wide, close-sheathed on the seaward face; and of a round timber cribwork block at the outer end 20 by 20 feet, with creosoted timber substructure and close-sheathed on all outer faces.

During the year 1902-03, the sum of \$649.87 was expended in repairing and leveling up the outer block, which had settled by undermining of the sandy bottom, and in

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protecting its base with brush and stone; also in replacing stone in the pile, brush and stone work, which, being uncovered, had been washed out by the sea.

On November 11, 1902, during a terrific north-west gale, the brush and stone in the work were washed out by the sea, and afterwards, for a distance of 130 feet, the piles were broken off and washed away, leaving the cribwork block at the outer end uninjured.

During 1903-04, the sum of \$1,449.87 was expended in replacing the damaged pile-work, for a distance of 130 feet with cribwork, in refilling the balance of the pile-work with brush and stone and in placing a covering over all; and further a quantity of ballast, about 160 cubic yards, was delivered to be used in the protection to the channel through the flat, inside of the beach.

During the fiscal year ended June 30, 1905, the sum of \$499.86 has been expended in constructing a pile, brush and stone work 100 feet in length, on the south side, and a brush and stone dam, 80 feet in length, on the north side of the channel through the flat, inside of the beach, for the purpose of confining the tidal streams. The work done has proved very satisfactory but will have to be extended to be a complete success.

Total expenditure up to June 30, 1905, is \$6,283.62.

#### OGILVIES.

Ogilvies, King's county. Ogilvie's breakwater wharf, is situated on the south shore of the Bay of Fundy, fifty-miles east of Digby gut and eleven miles north of Aylesford, on the Dominion Atlantic railway. Like other ports on the Bay of Fundy shore, in King's county, the trade has greatly declined since the construction of the Dominion Atlantic railway, being now restricted to occasional shipments of cordwood, fish and potatoes.

The work here, which serves both as a wharf and breakwater, was built in the year 1854, at the joint expense of the inhabitants and the provincial government. It is 270 feet long, 38 feet wide on top and about 27 feet high at the outer end, built throughout of the ordinary type of round-log cribwork and close sheathed on the outer end.

In 1884-85-86, the department expended the sum of \$3,156.63 in strengthening the outer end by building an entirely new block, 20 feet long, and by taking down and rebuilding the old break for a length of 100 feet; in 1890-91, general repairs were made. In 1891-92, the sum of \$500 was spent in repairing and strengthening the shoreward end, 90 feet in length. The face was taken down and rebuilt, being tied into the old work with new cross-ties, and the new work well filled with ballast. In 1897-98, a reinforcing block on the shore end of the east side was built 153 feet long, 10 feet wide and to the full height of the work, to support the breakwater, which was leaning over and threatening to fall. In 1898-99, the sum of \$50 was expended in placing about a dozen new fenders to replace those broken and decayed, and in making a few other trifling repairs. In 1900-01, the sum of \$500 was expended in repairs to the shore end of the structure, the work done consisting of the rebuilding of the crib breast-work, supporting the road approach on the inner end and shoreward side, the renewal of about 40 feet of the flooring and the placing in position of 40 new hardwood fenders on the seaward face, to replace those worn out by the wash of the gravel.

In 1904-05, the sum of \$1,870.30 was expended in widening the shoreward side of the outer end of the breakwater. The new work is 114 feet long, 10 feet wide and from 22 to 24 feet high.

At the close of the fiscal year the work was not quite completed.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

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## OYSTER POND.

Oyster Pond, Guysborough county, is one of several large ponds on the north shore of Chedabucto bay which form the only boat harbour between Cape Argos, on the western side of the southern entrance to the strait of Canso, and Guysborough harbour, a distance of fifteen miles.

In 1876, the entrance to the pond was improved by hand dredging and protected on its eastern side by the construction of a breakwater 180 feet in length. In 1884-85, the breakwater was extended 105 feet over a level bottom, dry at extreme low water. The width of the inner work is 14 feet and of the extension 16 feet. In 1896-97, the breakwater was strengthened and repaired.

Up to the time of the completion of the outer portion of the breakwater on the eastern side of the entrance in 1885, the beach on the western side was about 4 feet above high water and formed a natural protection to the best anchorage in the pond. Subsequently it was gradually worn away down to about half tide level and the sand and gravel of which it was composed was carried into the pond, decreasing the depth over the anchorage from 18 to 6 feet at low water.

A contract, entered into in 1897-98, for the construction of a beach protection work on the western side, 400 feet in length, 12 feet in width over 360 feet from the inner end, 16 feet in width over the outer 40 feet, and 8 feet in height, the top being 4 feet above extreme high water, was completed in 1898-99.

During the fiscal year 1904-05, the sum of \$449.69 was expended in constructing a 'spur' 40 feet in length, 16 feet in width and 8 feet in height at the outer end of the beach protection work on the west side of the entrance.

The depth, at extreme low water, over the bar obstructing the entrance to the pond, is about 1 foot 6 inches. Spring tides rise 6 feet.

The total expenditure up to June 30, 1905, is \$7,559.16.

## PARRSBORO.

Parrsboro' is an important town of about 2,800 people, situated on the right bank of the Partridge Island river, which empties into the north side of the Basin of Minas.

This new pier was constructed about four years ago; it consists of a short length of block and span work, 170 feet in length of pile-trestle bents and ends with a very substantial cribwork structure. It is situated at the narrow mouth of the harbour, and consequently, there is a strong current running by it and to it. The open spaces between the pile-trestles allowed this current to sweep through them and rendered it impossible, at a time other than ordinary, for a vessel to lie moored on the inner side of the pier. To ameliorate this condition of affairs, the department in 1903-04, expended the sum of \$899.17 in sheathing this portion of the work.

During the last fiscal year the sum of \$3,180.15 was expended in constructing an additional pier, at the head of this wharf, exactly the size of the old pier, thus making a double head and permitting vessels of all sizes to lay there. The new block is 37 feet square and 32 feet high.

Spring tides rise 40 feet; neaps, 33 feet.

## PEMBROKE.

Pembroke, Hants county, is a small farming and lumbering settlement with a population of about 175, situated on the south shore of Minas basin, nine miles east of Cheverie and three miles west of Walton. The lumbering industry is represented by the annual shipment of about three million feet of deals and from five to ten thousand pieces of piling. As an aid to local business and as a protection to vessels loading and discharging, the department awarded a contract on March 28, 1904, in the sum of \$7,970

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for the construction of a breakwater. At the close of the fiscal year, 1903-04, the work was half completed, the contractors having earned payments to the extent of \$4,400.

In 1904-05, the work was satisfactorily completed. The work, which is entirely detached from the shore, is 200 feet long, 20 feet wide on top and 22 feet high; on the seaward face it is plumb, and sheathed with 6-inch timber, having a break 5 feet high. On the shoreward side it batters 3-inch to the foot. The work was substantially built of round-log cribwork, filled solid with stone.

Spring tides rise about 48 feet; neaps, about 40 feet.

The expenditure during the last fiscal year was \$4,193.55.

#### PETIT DE GRAT.

Petit de Grat inlet, Richmond county, lies between Petit de Grat island and the eastern extremity of Madame island. The main entrance is at the southern end from the Atlantic. The northern entrance, from Rocky bay, is obstructed by outer and inner bars, through which passages for boats, at ordinary low water, were opened by the department between 1897-98.

During 1898-1899-1900-1901, both channels were widened and improved by hand dredging, and a cribwork protection was constructed on the western side of the outer channel.

At the end of June, 1901, the outer channel was about 350 feet long and 25 feet wide, with a depth of 2 feet at low water, while the inner was 285 feet long, 20 feet wide, and with the same depth as the outer channel. The protection work 298 feet in length, and consisting of ordinary round timber cribwork, was fully ballasted, but not covered.

The sum of \$1,000 was voted for expenditure during 1901-02, for the reconstruction of a portion of the protection work and for deepening the channels; but as it was found that the beach on the eastern side of the outer channel was moving rapidly to the westward, and had already encroached upon the channel, and the amount available was not sufficient to check the movement, the amount was not expended; and it was decided to abandon the old work and to open a new channel to the eastward of it.

The sum of \$2,600 was voted for expenditure during 1902-03 in opening a new channel, and for protecting its eastern side by cribwork. A portion of the materials were procured but as they were delivered only a few days before the closing of the fiscal year, out of the amount voted, the sum of \$916.36 only, was expended.

During the fiscal year 1903-04, the sum of \$2,197.36 was expended in the cutting of a channel 285 feet in length 20 feet wide in the bottom, and to a depth of 2 feet below low water springs, and in the construction of a protection work on the eastern side of the channel, 200 feet in length, 12 feet wide for a distance of 160 feet, and 20 feet wide for the remaining distance of 40 feet; constructed with round timber, fully ballasted and fendered; the outer end for a distance of 40 feet covered with plank, and the eastern face; the end and the western face, for a distance of 40 feet from the outer end, close-sheathed with hardwood plank.

Out of the amount voted for expenditure during 1904-05, the sum of \$928.64 was expended in the construction of an extension to the breakwater, 40 feet in length and 20 feet wide; in deepening the channel some 6 inches, and in the removal of several boulders at its mouth.

Spring tides rise 6 feet.

Total expenditure to June 30, 1905, \$9,292.36.

#### PICKET PIER.

Picket Pier, King's county, is situated on the south side of the mouth of the Haba-tant river, two miles below the village of Canning and at the lower end of the village

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of Canard. It is conveniently placed with regard to a large and thickly populated area of the richest fruit growing and agricultural land in Nova Scotia.

The wharf was begun in 1845, and extended in 1859-60 by the inhabitants aided by the provincial government. Since these dates the department has expended upon it, in renewals and repairs, in 1878, \$500; in 1885, \$100 and in 1886, \$500.

It is 190 feet long, 60 feet wide and at the outer end, which is now about 2 feet below high water O.S.T., it is 20 feet high.

During the year 1896-97, the sum of \$498.88 was expended on some very necessary repairs. The work done consisted of the rebuilding of the crib breastwork, along the outer face of the shoreward end for a length of 170 feet that had fallen into decay and threatened to make an island of the main portion of the wharf. Portions of the top of the wharf were also filled up with stone and gravel so that teams could come alongside vessels loading potatoes and other produce.

Since 1897, the work had become so dilapidated as to be practically useless for shipping purposes and the department accordingly expended the sum of \$2,309.65 in beginning the construction of a pilework pier over and on top of the ancient cribwork structure.

In 1904-05, the sum of \$2,104.62 was expended in continuing the construction of the pile wharf begun last year. The new wharf is 265 feet long, the outer 105 feet being 67 feet wide, the shoreward 85 feet in length 25 feet wide, and the intermediate 75 feet widening from 25 to 67 feet. The outer end is 26 feet high, having 23 feet of water at H.W.O.S.T., and none at L.W. Shorewards of the pilework is an approach of earth and gravel 150 feet long, protected along its whole length on the north side by cribwork 10 feet wide and from 6 to 10 feet high.

At the close of the fiscal year the work was not quite completed.

Spring tides rise about 40 feet.

## PICOU LIGHT BEACH.

The beach forming the southern side of the entrance to Pictou harbour, known as Pictou Light Beach, extends one mile in a northerly direction, inclosing Moodie cove, an inlet nearly dry at low water, except in a central channel. The outer end of the beach, on which stands a lighthouse and keeper's dwelling, is protected by a breastwork of squared timber, 450 feet in length, and by a work of brush and stone extending from side to side of the beach, opposite the southern extremity of the breastwork, and inclosing property under the control of the Department of Marine and Fisheries.

In 1894-95, the sum of \$300 was expended in acquiring a title to a portion of the beach 1,520 feet in length, adjoining the property of the Department of Marine and Fisheries.

During 1898-99, a brush and stone work 1,030 feet in length 10 feet wide and 4 feet in height was constructed along the beach to prevent its wearing away by the action of the seas during gales; and two groynes, respectively 65 and 55 feet in length, composed of piles, brush and stone, were built off the brush and stone work for the purpose of gathering the sand.

In 1900-01, the sum of \$522.77 was expended in the construction of a third groyne extending 75 feet from the breastwork built by the Department of Marine and Fisheries, 200 feet to the northward of the first groyne at end of breastwork, and in slight repairs to the brush and stone work; but the groyne completed in November was undermined and destroyed during a heavy easterly gale early in December, 1900.

During 1901-02, the sum of \$608.28 was expended in raising the brush and stone work, which had settled, for a distance of 710 feet, and as it was found that the beach south of the end of the work was wearing away, the protection work was extended for a distance of 120 feet. The extension consists of brush and stone work, 10 feet wide and of an average height of 4 feet.

Spring tides rise 6 feet.

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The work for which the appropriation for 1903-04 was intended, viz.: the reconstruction of the breastwork at the outer end of the beach, was performed during that year by the Department of Marine and Fisheries.

During the fiscal year 1904-05, the sum of \$598.83 was expended in reconstructing one of the two groynes, forming part of the protection works constructed by the department, and in repairing the other. The new groyne is 79 feet in length, 9 feet in average width and 9 feet in height, of cribwork, fully ballasted, covered with 3-inch plank and close-fendered at the outer end.

The total expenditure to June 30, 1905, is \$4,209.08.

#### PIPER'S COVE.

Piper's cove, Cape Breton county, is on the north-east end of the Great Bras d'Or lake, between the entrances to East bay and Barra strait.

The cove is open from south to west, the heaviest seas being from the south-west, where they have a rake of twelve miles. At the head of the cove there is a small pond separated from the lake by a beach of sand, about 100 feet wide and 4 feet above high lake level.

As the sum of \$1,500, granted for expenditure during 1904-05, for a boat harbour, was entirely too small to construct any work of practical benefit, particularly as the teredo is very destructive in the lakes, and creosoted timber would have to enter largely in the construction of any work here, the amount granted was not expended.

A report with plan, on the construction of a work, such as to meet the wishes of the inhabitants, was submitted in February, 1903.

#### PLEASANT BAY.

Pleasant Bay, Inverness county, is on the western coast of Cape Breton island, twenty-four miles north of Cheticamp and about midway between that place and Cape St. Lawrence.

During the fiscal year 1904-05, a plan and specification for a wharf estimated to cost \$8,000 were prepared. Tenders were invited in March, but up to June 30, a contract had not been signed.

The wharf is to be a continuous cribwork structure, 210 feet in length and from 16 to 20 feet in width, with an 'L' at the outer end, 20 by 20 feet, creosoted to half tide, fully ballasted, and close-sheathed on both sides and at the outer end. The depth at the outer end, at extreme low water, will be 5 feet. Spring tides rise 4 feet.

Expenditure during last fiscal year, \$104.65.

#### PLYMPTON.

Plympton, Digby county, is a fishing and farming village of 200 or 300 people, situated on the east shore and near the head of St. Mary's bay, twelve miles south-west from Digby, and eight miles north-east of Weymouth.

Some years before confederation, the provincial government built a wharf of cribwork, 230 feet long, 35 feet wide and at the outer end 22 feet high, giving at H.W.O. S.T., a depth of 19 feet of water, at a cost of \$3,543.97.

In 1874-75, the department extended the work by a block 34 feet square on the outer end, and made some necessary repairs to the rest of the work.

In 1900-01, extensive repairs were made at an expenditure of \$1,200. The north side and shoreward end was rebuilt from the bottom a length of 166 feet, a width of 10 feet at the top and about 15 feet at the bottom, by a height of some 4 feet to 17 feet, the outer 66 feet in length was also repaired by placing two new longitudinalinals on each side, besides a new top piece to the break, and 7 new mooring posts.



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In 1904-05, the sum of \$1,030.58 was expended in extending the wharf by the construction of a new block, 35 feet long, 35 feet wide and 22 feet high. At the close of the fiscal year the work still lacked  $2\frac{1}{2}$  feet of finished height.

The total expenditure to June 30, 1905, is \$5,874.55, including a refund of \$100 to the provincial government in 1887-88.

This work was transferred to control of the Department of Marine and Fisheries on June 12, 1888.

Spring tides rise 22 feet; neaps, 18 feet.

## PORT AU PIQUE.

Port au Pique, Colchester county, is a thriving farming and lumbering settlement of some 400 or 500 people, situated on the north shore of the Basin of Minas, about eight miles west of Great Village and six miles east of Bass River.

Hitherto, in the absence of a wharf, vessels coming to either load or discharge have had to lie aground on the beach, where they could be reached by teams at low water. This was a dangerous practice and resulted in the destruction of several vessels in the course of the last few years. To encourage and develop local trade, and for the convenience of shipping, the department in 1903-04, expended the sum of \$543.62 in the purchase and delivery of materials for the purpose of constructing a suitable public wharf of pilework.

In 1904-05, the sum of \$1,884.23 was expended in completing the work for which timber was purchased in the previous year. The wharf, which is of pilework, is 150 feet long, 20 feet wide, with an 'L' on the outer end, giving a face length of 55 feet with a height of 26 feet and a depth of water at H.W.O.S.T., of about 22 feet.

Spring tides rise  $50\frac{1}{2}$  feet; neaps,  $43\frac{1}{2}$  feet.

## PORT DUFFERIN.

Port Dufferin, Halifax county, formerly called Salmon River, is a thrifty village of some 500 or 600 people engaged in fishing, lobster-canning and gold mining, situated at the mouth of Salmon river, that empties into the inlet known as Beaver harbour, about eighty-five miles east from Halifax by high road and about half way between Halifax harbour and Canso.

Up to twenty-five or thirty years ago, the harbour, which though small is well sheltered, had a depth of from three to four fathoms up to its extreme head, but after the establishment, about twenty years ago, of the crushing mills of the Dufferin Mining Company, on the stream three miles inland, this depth was gradually reduced by the deposition of the refuse crushing in the form of fine sand, which were thrown into the stream until there were only 3 or 4 feet of water at low water ordinary spring tides.

The trade of the place suffered in consequence to no inconsiderable extent, and even small vessels have difficulty in approaching at low tide the lower of the two private wharfs, in the upper part of the harbour. Sailing packets engaged in coasting make fortnightly calls, and a steamer running between Halifax and Charlottetown, P.E.I., via intermediate ports, calls at the port once, and sometimes twice, each week.

To restore this harbour to its former usefulness, the departmental dredge 'George McKenzie' operated here in 1893-95, deepening the channels and approaches to all wharfs and dredging turning berths, to 13 feet at L.W.O.S.T., at an expense of \$4,654.46.

In 1898-99, the sum of \$1,646.89 was expended in constructing a public wharf. The work consists first of a stone and earth embankment, 106 feet long, 35 feet wide and of an average height of about 4 feet followed by a block of cribwork 142 feet long and 28 feet wide with an 'L' on the outer end, giving a face length of 56 feet. The height of the wharf is from 8 to 20 feet, it is constructed of cribs 7 feet square, covered by 3-inch plank and filled up to H.W. with stone ballast.

In 1904-05, the sum of \$481.16 was expended in putting a new floor on the wharf, including plank, stringers and guard timbers.

## PORT GEORGE.

Port George, Annapolis county, is a village of some 400 people situated on the south shore of the Bay of Fundy, thirty-seven miles north-east of Digby gut, forty-two miles south-west of Scott's bay, nine miles south-west from Margareville and seven miles north-west from Middleton on the Dominion Atlantic railway.

Some years before confederation the provincial government built a western breakwater and an eastern pier or wharf. The breakwater is 440 feet long, from 25 to 35 feet wide on top and at the outer end, where there is about 21 feet of water at H.W.O. S.T., it is about 25 feet high. It is built of round-log stone-filled cribwork, the western or seaward face and outer end being close-sheathed.

The wharf on the eastern side of the little harbour is 205 feet long, 20 feet wide and 18 feet high at the outer end. It is built of round-log cribwork, and the outer end, on which is built a small lighthouse, is close-sheathed. In 1874, the harbour was taken in charge by this department, and in that and the following year, the sum of \$7,000 was expended in repairing and refacing the breakwater which was much decayed. In the autumn of 1888, the outer end of the breakwater was destroyed by a severe storm, 165 feet in length being wrecked, and an additional length of 30 feet being much injured. Before repairs could be made, a second storm destroyed the damaged portion leaving 195 feet of the work a complete wreck and rendering the harbour practically useless.

In 1900-01, the destroyed portion of the work was rebuilt by contract.

In April, 1894, an exceptionally severe north-east gale, caused a serious breach in the breakwater at about midway of its length, or immediately shorewards from the new outer block.

The breach was 40 feet long for the full width of the work and about 17 feet high; it was closed in the autumn of the same year.

In 1900-01, the sum of \$400 was expended in repairing the eastern breakwater wharf. The outer 30 feet in length was refloored, and the close-sheathing for the same length renewed. New fenders, guard-timbers and mooring posts were also placed. The sum of \$1,653.60 was also expended in the construction of a detached breakwater about 200 feet eastward from the main end of the work. The object of this is to break the seas and afford a much needed shelter to schooners lying alongside the breakwater.

In 1901-02, the sum of \$2,297.46 was expended in continuing the construction of the detached breakwater begun the previous year. The work thus extended measured 102 feet long, 32 feet high at the lower end and 26 feet at the upper, 20 feet wide at the top. It is plumb on the seaward face and batters 1 in 4 on the back.

In 1902-03, the sum of \$2,287.46 was expended in beginning the construction of an extension of 100 feet in length of this work.

In 1903-04, the sum of \$5,807.95 was expended in completing the breakwater begun in 1901 and in renewing the top of 200 feet in length of the main breakwater a height of from 3 to 5 feet. The detached breakwater is 200 feet long, 20 feet wide on top and from 17 to 32 feet in height. It is very strongly built of round-log cribwork filled with stone.

In 1904-05, the sum of \$199.50 was expended in replacing eight fenders that were torn off and in rebolting six fenders that were loosened by a great storm on January 5, 1905, and also in replacing guard-timber and top longitudinals for a length of 50 feet.

The total expenditure to June 30, 1905, is \$37,804.96, including a refund to the provincial government in 1887-88, of \$1,076.75.

This work was transferred to the control of the Marine and Fisheries Department on June 12, 1888.

Spring tides rise 30 feet.



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## PORT GREVILLE.

Port Greville is a village of about 350 people, situated twelve miles west of Parrsboro'. Important shipbuilding and lumbering interests are located here, which are mainly dependent upon the security of the harbour.

The harbour is formed by a high gravel bar, lying parallel to the shore, inside of which the river runs for half mile before reaching low water mark. For the purpose of protecting this harbour which was threatened with destruction, the department in 1874, constructed upon the bar a cribwork wall, 2,200 feet long, 10 feet wide on top with an average height of 7 feet. This was rebuilt in 1902-03 at a cost of \$4,071.10.

In the fiscal year 1886-87, the department constructed a breakwater, off the eastern end of this protecting wall, for further protection to the harbour as the gravel was washing into the harbour around the end of the beach protection. It was 250 feet long, 21 feet wide on top, with an average height of 20 feet, sloping on the seaward end of  $\frac{1}{2}$  in 1, whilst the seaward end and outer faces were sheathed with 6-inch plank well fastened.

During the fiscal year 1903-04, the sum of \$697.59 was expended in repairing this breakwater. During the last fiscal year the sum of \$398.84 was expended in completing these repairs. Besides these repairs a contract was let to extend this breakwater a further distance of 150 feet, seaward. The contract price was \$11,460. The work was about half completed at the expiration of the fiscal year.

This work was rendered necessary because the gravel was washing around the end of the old breakwater and was gradually filling in the harbour and to permit small steamers calling at Advocate, Spencer's Island, &c., to call here.

Spring tides rise 40 feet and neaps, 34 feet.

Total expenditure during last fiscal year, \$6,649.08.

## PORT HAWKESBURY.

Port Hawkesbury, Inverness county, is on the eastern side of the Strait of Canso, nearly opposite Port Mulgrave.

The sum of \$2,000 was appropriated for expenditure in 1901-02 towards the construction of a wharf. During the year a survey was made and a plan and specification prepared for the reconstruction of a wharf known as the 'long wharf.'

A contract was entered into on September 11, 1902, for the reconstruction of the 'long wharf' for the sum of \$9,450.

The work under contract comprised the construction of an abutment 35 feet in length, with end and side walls of stone; the reconstruction from 2 feet above low water of 391½ feet of block and span work, including eight cribwork blocks 31 to 38 feet in length and 22 to 24½ feet in width; and the reconstruction and extension of the 'head' including the removal to 2 feet above low water of parts of two cribwork blocks and the construction of a cribwork and pile-head 73 feet 9 inches in line of work by 112 feet.

Construction was commenced April 23, 1903, and satisfactory progress was made up to June 30, when the new cribwork over all blocks, excepting one, was approaching completion, and when the estimated value of work performed was \$2,780.

Operations were continued up to October 19, 1903, when it having been ascertained that ledge rock would prevent the construction of the pilehead, a contract was entered into, for the removal of cribwork and ballast covering the site of a proposed cribwork head, for \$2,900.

The work was commenced October 12 and completed November 26, 1903.

Subsequently separate contracts were made for the removal of the outer block of the approach (damaged by ice) for \$900, and for the construction of a cribwork 'head' in place of a pile 'head'; the reconstruction of the outer block of the approach. and

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the construction of a roadway at the inner end for \$6,700. Operations were resumed June 13 and were in progress at the close of the fiscal year.

The expenditure to June 30, 1904, was \$10,840.51.

The work under contract, and the additional work referred to as having been undertaken in 1902-03, were completed on September 19, 1904.

On March 27, 1905, an agreement was entered into for the construction of a warehouse 80 feet in length and 29 feet in width at the outer end of the wharf, and for repairing and improving an old warehouse at its inner end, including the fitting up of a waiting room therein, for the sum of \$1,955 and on the understanding that payment would be made in 1905-06. The works were put in hand without delay and completed in time for the opening of navigation about May 15.

Expenditure during last fiscal year, \$12,517.54.

#### PORT HOOD PIER.

Port Hood, the shiretown of the County of Inverness, is on the west coast of Cape Breton island, twenty miles north of the northern entrance to the Strait of Canso.

A pier on the east side of the harbour, commenced by the provincial government in 1865, was originally 550 feet in length and 24 feet in width, with an 'L' on the south side of the outer end, 100 feet in length and 25 feet in width. It came under the charge of the federal government in 1871, since which time extensive repairs and renewals have been made, including the construction of a new block, 125 by 25 feet, at the outer end, in 1873; the construction of a block 50 by 32 feet at the south end of the 'L' in 1888-89; and the construction of a block 71 by 24 feet at the outer end in 1889-90. The old provincial government work was of square timber, close-faced; the additions and parts reconstructed by the department are of round timber laid open-faced. The piers have been protected on the seaward side, at the outer end, and on the south end and inner side of the 'L,' by close-piling, and on both sides to within 74 feet of the outer end by a stone talus.

In 1902-03, the sum of \$199.99 was expended in urgent repairs, including replacing ballast where required and temporary repairs to the covering.

In 1903-04, the sum of \$1,500.01 was expended in repairing and strengthening the outer end of the pier. The work performed included: close-piling (inside) and rebalasting the face chambers at the outer end and on the seaward side near the outer end; repairing the covering, and renewing the close-piling at the outer end and on the seaward side in places.

During the fiscal year 1904-05, the sum of \$1,799.86 was expended in repairing and strengthening the outer end of the pier. The work performed included; placing 229 cubic yards of quarried stone in the talus, on the north side; renewing the close-piling of north face, near the outer end and at the outer end where required; renewing floor-stringers, covering and cap-timbers over 150 feet of the approach and in general repairs.

The total expenditure to June 30, 1905, including \$916.11 refunded the provincial government, was \$63,392.06 and \$2,079.58 for dredging.

#### PORT HOOD HARBOUR.

The harbour of Port Hood is on the west coast of Cape Breton island, about twenty miles to the northward of the northern entrance to the Strait of Canso.

The harbour was formerly a secure one, Smith island, which forms its west side, having been connected with the mainland by a range of sand hills. In 1893, the sea made a breach through this protection; the opening, at first narrow, was enlarged by the tidal currents with increasing rapidity until it was entirely swept away. The harbour is not unsafe during northerly gales, except in a small cove on the east side of Smith island.

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In March, 1902, a report was submitted on the closing of the northern entrance in which the estimated cost of work suggested varied from \$482,000 to \$291,000, according to design and location.

The amount appropriated for 1903-04 (\$20,000) was for expenditure by day labour in constructing a portion of a breakwater of brush and stone with stone talus and covering. Operations were commenced in May and were in progress at the close of the fiscal year ended June 30, when the expenditure amounted to \$2,958.95. This sum was expended in procuring materials and in constructing a work of brush and stone 28 feet in width on top, at high water level, extending from the mainland 330 feet to 3 feet at extreme low water.

During the fiscal year 1904-05, the sum of \$19,942.43 was expended in extending the brush and stone work 470 feet, 800 feet from the mainland, to 6 feet at extreme low water, and in placing a talus, on both sides, and a covering of quarried stone.

Spring tides rise 4 feet.

## PORT LATOUR.

Port Latour, Shelburne county, is a fishing and farming settlement, situated twenty-five miles south-west of Shelburne town. Population, 700.

The harbour is about four miles long, north and south, and two miles wide, east and west, with a depth of water of from five to seven fathoms. Spring tides rise 10 feet, neaps 7 feet.

Though the outer harbour is somewhat exposed to the south-east (this being the quarter from which the most destructive and severe gales arise), the inner harbour formerly afforded some measure of shelter and protection to the northward and westward of the sand-flats, lying between Page's island and Swain's point, on which there is from 6 to 8 feet of water at L.W.O.S.T.

Since an unusually heavy storm, some years ago, tore from these flats the thick growth of eel-grass, with which they were covered, the undertow now washes over them. Vessels lying at anchor, awaiting a cargo or favourable wind, are in danger of dragging ashore, and the need of a protected anchorage is therefore unquestioned.

To most effectually meet this requirement, it was necessary to construct a breakwater, starting from Swain's point and running in a north-easterly direction.

During the fiscal year 1898-99, the sum of \$3,561.75 was expended; during the next fiscal year the sum of \$2,984.10 was expended; in 1902-03, the sum of \$1,012.34 was expended; during 1903-04, the sum of \$1,097.64, and during the last fiscal year the sum of \$2,695.96 making a total expenditure to date of \$11,331.79.

The work performed during the last year consists of the extension of the stone work a further distance of 71 feet, with a width of 25 feet on top, and from 30 to 34 feet on the bottom, it being 17½ feet high at the beginning of this year's work and 20 feet at its present outer end.

The work done this last year contains about 1,499 cubic yards at a cost of \$1.78½ per cubic yard.

The outside and inside walls of this bank are each 5 feet in thickness, composed of large stones, carefully cemented, whilst the inside, 15 or 18 feet in width, is filled with smaller stones to a height 9 inches below the top, which 9 inches were in turn filled with gravel of good quality. Besides this there is a break of 8 or 10 inches of cut granite, running the entire length of the work along the outside, which is also rip-rapped with from 200 to 300 tons of large boulders.

The work at present affords much local protection and when completed will no doubt afford ample protection for all interests concerned.

## PORT LORNE.

Port Lorne, Annapolis county, formerly called Port William or Marshall's Cove, is situated on the Bay of Fundy, thirty-two miles north-east of Digby Gut, and six

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miles north west from Paradise station, on the Dominion Atlantic railway. The settlement comprises about 300 people engaged in fishing and farming.

The breakwater was begun in 1835, at the joint expense of the inhabitants and the provincial government, the outlay on the work up to 1867, being \$16,000. The first work done by this department was in 1873-74, when the breakwater was extended a length of 67 feet. In 1882-84, the work was further extended a length of 100 feet, width 35 feet and height 25 feet. The new block was built close-faced with square timber both inside and outside, and provided with a break 4 feet high. During the next few years several repairs were made. In 1897-98, a re-enforcing block was built on the seaward face and outer end of the breakwater, 78 feet long, 37 feet high and 13 feet wide, in addition to other important repairs made.

In 1900-01, the sum of \$2,186 was expended in important repairs. The work done consists of the building, to the full height of the breakwater, of a portion of buttress on the seaward side, 91 feet long; the rebuilding of 12 feet in length of the top of the main work, immediately shorewards from the new portion of buttress, and the reflooring of the greater part of the length of 91 feet abreast of the buttress.

In 1902-03, the sum of \$1,198.48 was expended in rebuilding a portion of the shore end of the seaward face of the breakwater, 50 feet long, 15 feet wide and from 6 to 15 feet high, with solid stone-filled cribwork; also in rebuilding a portion of the break on the shore end 33 feet long, 8 feet wide and from 6 to 10 feet high.

In 1904-05, the sum of \$999.93 was expended in taking down and rebuilding a portion of the shore end of the breakwater which was very much decayed and in miscellaneous repairs to the rest of the work.

The total expenditure to June, 1905, is \$20,339.04 including a refund to the provincial government of \$1,589.33 in 1887-88.

The work was transferred to the control of the Department of Marine and Fisheries on June 12, 1889.

Spring tides rise 30 feet.

#### PORT MAITLAND.

Port Maitland, Yarmouth county, is a prosperous and important fishing and farming village, with a population of about 600, situated on the south-east side of the mouth of the Bay of Fundy, twelve miles north of the county town of Yarmouth.

The harbour works were begun about the year 1859, by the provincial government; they consist of an eastern and western or main breakwater of cribwork. The former is 400 feet long by some 20 feet wide, and the latter 500 feet long, 22 to 25 feet wide, with a return of 54 feet long, 24 feet wide and 27 feet high, along which there is a depth of 19 feet at H.W.O.S.T. These breakwaters or piers inclose between them a snug high water harbour of two and a quarter acres in extent.

In 1873-74, the eastern breakwater was raised and widened for a length of 158 feet on the shore end and an extension of 50 feet in length was built on the outer end of the western breakwater. In 1885-86, the sum of \$349.92 was expended in raising the outer end of the eastern breakwater, and in repairing and partly renewing the sheathing of the outer face of the western breakwater. During 1887-88, the western breakwater was repaired, and in the following year, 1888-89, both sides of the breach were closed up, and a number of fender piles were driven along the outer face and exposed corners of the broken work.

On June 24, 1890, a contract was made for rebuilding the destroyed section and repairing the other parts of the work. The seaward face, i.e. 83 feet in length outside the new work, and 100 feet between it and the shore was close-piled; the entire top was rebuilt and new fenders were fitted on the inside face. In 1891-92, the sum of \$296.45 was expended in repairing the eastern breakwater. In 1895-96, the sum of \$271.71 was expended in the purchase of materials. In 1896-97, the sum of \$3,304.79 in extensive repairs and renewals to both works. On the eastern breakwater, which

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also serves as a wharf for the landing and loading of general merchandise, coal, lumber, &c., the shoreward 30 feet was rebuilt on the south side, 6 logs high, and on the north side, three logs high, including floor-stringers and covering; 22 feet in length of the new covering was laid on the outer end, and a number of new fenders were bolted into position. On the western breakwater, a re-enforcing block was built on the south side of the outer end, 97 feet long, 11 feet wide and 12 to 14 feet high, or to a height of about 10 feet below the floor of the work; a re-enforcing block was also begun along the whole length of the 'L' 70 feet in length and from 10 to 12 feet wide. To obviate settlement, due to soft bottom, and the eating away of the bottom logs by the limnoria, it was built on 147 piles, driven to hard bottom and cut off level with the beach. The inner or north side of the shoreward end was also strengthened and rebuilt.

In 1897-98, further repairs and renewals to the breakwaters were made at a cost of \$3,600. The re-enforcing block along the 'L' of the western breakwater was completed to the full height of the work, and the inner face of the outer end was renewed. The buttress on the outer side was extended shorewards a length of 122 feet. On the end of the eastern breakwater the 'T' was rebuilt 50 feet long, 20 feet wide, and built on 21 piles, driven to hard bottom and cut off level with the beach. Various miscellaneous repairs were also effected.

In 1898-99, under expenditure of \$710.35, thorough and extensive repairs to the western breakwater were completed and 60 feet long on the inner face was close-sheathed, the buttress on the seaward side, 140 feet long, was finished and several vacant spaces in the shoreward end were filled with ballast.

In 1899-1900, the re-enforcing buttress on the outer end, seaward face of the breakwater, 96 feet long, 10 to 12 feet wide to the full height of the work, was rebuilt. The lower 12 feet of this work, and the outer end of the work were also sheathed with 4-inch creosoted plank as a protection against the limnoria. The expenditure was \$2,246.73.

In 1900-01, a piece of buttress on the seaward side of the breakwater, 90 feet long, 19 to 20 feet high and from 10 to 11 feet wide, adjoining shorewards the piece 96 feet long which was built the previous year, was constructed. The outer face of the new piece of buttress was also sheathed 12 feet high with creosoted 4-inch plank as a protection against the limnoria. The expenditure was \$1,017.66.

In 1901-02, the sum of \$299.44 was expended in close-sheathing with 5-inch plank a length of 110 feet of the shore end of the seaward face of the breakwater, from which the old sheathing had been stripped away by heavy seas earlier in the year.

In 1903-04, the sum of \$1,500 was expended in raising to the full height of the breakwater the buttress on the seaward side for a length of 65 feet and width of 12 feet and height of 14 feet. Also the taking down and rebuilding of an equal length, 65 feet on a height of 8 feet of the main portion of the breakwater that was very much decayed.

In 1904-05, the sum of \$1,465.72 was expended in taking down and rebuilding 153 feet in length of the top of the shoreward end of the breakwater, which was much decayed; 80 feet in length of planking was renewed, and a number of fenders broken by ice the previous winter were replaced by new ones. On the north wharf, a few fenders and deck plank and one mooring post were renewed.

The total expenditure to June 30, 1905, is \$28,198.31 including a refund of \$1,971.66 to the provincial government in 1887-88.

This work was transferred to the control of the Department of Marine and Fisheries on June 22, 1885.

Spring tides rise 18 feet; and neaps, 15 feet.

## PORT MOUTON.

Port Mouton proper, is a settlement of about 400, situated ten miles south-west of Liverpool town.

About forty years ago, the provincial government built a wharf at this place. It

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was not very strongly constructed and gradually became so shaky and dangerous, that in the early part of 1900 this department constructed a new wharf costing \$2,372.49.

The wharf consists of a rock bank approach 56 feet in length, 35 feet wide, and 8 feet high at its outer end, supplemented by five cribs built of round logs and filled with stone ballast, each crib being 28 feet long, 32 feet wide and separated from each other by spans 15 feet long.

During the last fiscal year the sum of \$106.27 was expended in raising, grading and effecting slight repairs to the rock-bank approach. This approach was raised 1½ feet by adding small stones with a top course of good coarse gravel; the sides of the bank which were slightly damaged, were also repaired.

Spring tides rise here 7 feet; neaps, 5 feet.

#### PORTER LAKE.

Porter's Lake, Halifax county, is a long and narrow strip of fresh water, lying nearly north and south, situated about the middle of Halifax county, or about fifteen miles east of the provincial capital. It is about eighteen miles in length from a quarter to a half mile in width, and the water being of good depth for almost its entire length. It is navigable for vessels of about sixty tons, to the extreme head. The normal level of the lake is some two or three inches above high water O.S.T., which on the coast here rise 6 feet, neaps, 5 feet.

Up to about 1873, the outlet, which was directly into the Atlantic through a gravel beach, about 200 feet wide was navigable for schooners drawing 6 feet of water, and a considerable trade was then done on the lake in the export of timber, lumber, cordwood, general farm produce and fish. Since that time the outlet has been gradually and permanently filling up with accumulations of gravel washed in by southerly and easterly storms. In order to maintain the outlet, to prevent the roads along the margin of the lake from being flooded and also to admit fish into the lake, the following small expenditures have been made by the department :—

1881-82. . . . .	\$ 200 00
1884-85. . . . .	200 00
1889-90. . . . .	200 00
1892-93. . . . .	147 00
1897-98. . . . .	100 00
1898-99. . . . .	200 00
1899-1900. . . . .	150 00
1902-03. . . . .	49 99
1903-04. . . . .	300 15
1904-05. . . . .	166 40

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\$1,713 54

These expenditures having resulted in but slight temporary relief, and no permanent improvement, the department in 1900-01, expended the sum of \$8,262.44 in beginning the construction of a permanent channel through the neck of land 2,400 feet wide, separating the main body of the lake from the extreme head of Three Fathom harbour. In 1901-02, a further sum of \$5,987.24 was expended on the permanent outlet. In 1902-03, the sum of \$2,455.67 was expended on the permanent, and \$49.99 on the temporary (old) outlet.

In 1904-05, the sum of \$4,273.67 was expended on the new or permanent outlet and \$166.40 on the old outlet.

Total expenditure to June 30, 1905 :—

On permanent outlet. . . . .	\$20,979 02
On temporary outlet. . . . .	1,713 54
	<hr/>
	\$22,692 56



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## SANDY COVE.

Sandy Cove, Digby county, is a thrifty and beautifully situated fishing and farming settlement of some 400 people, situated on Digby Neck, twenty miles south-west of Digby town.

On February 12, 1903, a contract in the sum of \$13,000 was awarded by the department for the construction of a breakwater in the cove on the eastern, or Bay of Fundy side of the Neck, with the object of affording some much needed shelter to the fishing fleet.

The work, which was completed early in November, 1904, is 211 feet long, 30 feet wide on top and 31 feet high at the outer end, where, at H.W.O.S.T., there is about 27 feet of water. The work is of solidly built round-log cribwork, the lower portion, up to 5 feet above L.W.O.S.T., being of creosoted timber, to resist the attacks of the limnoria which are prevalent and destructive.

An additional sum of \$829.48 was paid the contractor, on account of the settlement of the work requiring additional height of some 5 feet.

Spring tides rise 23 feet; neaps, 19 feet.

Total expenditure during fiscal year of 1904-05, \$2,927.48.

## SAULNIERVILLE.

Saulnierville, Digby county, with a population of about 250, is situated on the north-east coast of St. Mary's bay, Bay of Fundy, thirty-six miles south-east of Digby, thirty-two miles north of Yarmouth and three miles north of Meteghan river.

Some years before confederation, a breakwater, serving also as a landing wharf, was built by the inhabitants aided by the provincial government. In 1876, the sum of \$4,000 of which half was contributed by the department and half by the inhabitants, was expended in making thorough repairs to the work and extending it to a length of 100 feet.

In 1889, further extensive repairs were made at a cost of \$1,859.59.

In 1891-92, \$17.60 was expended in trifling repairs.

In 1899-1900, the damage done by a severe storm in 1900, was made good. In 1900-01, the sum of \$1,999.49 was expended in repairs and extension. The repairs which were to make good the damage done by a great tide and storm of March 1, 1900, consist of the renewal of the outer 60 feet in length. The work was extended a length of 37 feet, it is substantially built of round-log cribwork, close-sheathed on the seaward side and outer end, 33 feet wide and from 20 to 24 feet high.

In 1901-02, the sum of \$719.97 was expended in reflooring the shoreward end of the breakwater for a length of 138 feet.

In 1904-05, the sum of \$1,999.29 was expended in extending the breakwater by a new block, 31 feet long, 37 feet wide and 23 feet high, some close-sheathing torn off by ice during the previous winter was replaced, and portions of the break were rebuilt.

The total expenditure by the department to June 30, 1905, is \$8,522.98, including a refund to the provincial government of \$1,926.53 in 1887-88.

Spring tides rise 21 feet; neaps, 18 feet.

At low water the sand flats are bare for several hundred feet beyond the end of the work.

## SEASIDE.

Seaside, Inverness county, is on the east side of St. George's bay near the southern entrance to Port Hood harbour and about two miles west from Port Hood, the shire town of Inverness county.

The wharf at this place, undertaken in 1895-96 and completed the following year, is 300 feet in length and 20 feet in width on top, of open-faced cribwork, close-fendered at the outer end and fully ballasted. The substructure is of creosoted timber and the

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superstructure of native timber. The depth at the outer end, at extreme low water, is 7 feet. Spring tides rise 4 feet.

About one year after its completion, ballast went out of some of the face chambers at the outer end between the bottom timber and the uneven rock on which the work is founded. Subsequently there was a further loss of ballast, and in the spring of 1904, the work was moved by ice from the south 11 feet out of line, at the outer end, the movement commencing 74 feet in from the outer end.

During the fiscal year 1904-05, the sum of \$177 was expended in filling the outer end face-chambers with concrete to low water, and above that level with ordinary ballast.

#### SCOTT'S BAY.

Scott's Bay, King's county, is on the south side of Minas channel, Bay of Fundy, between Cape Split and Baxter's harbour. The population of the settlement, within a radius of a couple of miles, is about 500.

In 1878-79, the department built a block of cribwork 50 feet long, 30 feet wide and about 20 feet high, connected with the shore by a double row of close-piling, 210 feet long, from the south-east corner of the block; the cribwork was built of close-faced work, well fendered and ballasted. The work was located on the west side of Jess creek, and formed a harbour or shelter for vessels during south-west storms.

As it had no floor, much of the ballast has been removed, presumably for ballasting schooners. Both the block and close-piling are more or less dilapidated, 30 feet in length of the close-piling and the upper 15 feet in height of the block being totally destroyed. The expenditure on this block and the close-pile work by the department from 1867 to 1882 was \$3,000.

In 1900-01, the department expended \$500 in building two blocks of cribwork, one on either side of the mouth of the creek. The northern block is 115 feet long, 15 feet high and 19 feet wide; also in extending the south breakwater by a block 75 feet long, 10 to 12 feet high and 12 feet wide. Some minor repairs were made to the older portions of the northern breakwater.

In 1903-04, the department expended the sum of \$1,342.52 in further improvements. The work done consists of the construction of a new block of cribwork in extension of that built in 1901-02, 57 feet long, 20 feet wide and from 16 to 21 feet high, also to raising to full height and finishing the new block on the south side of the creek begun in 1901-02.

In 1904-05, the sum of \$998.84 was expended in constructing a new block of cribwork, 57 feet long, 20 wide and 18 feet high, in extension of the breakwater on the south side of the mouth of the stream; a small cross-block on the shore end of the same work 50 feet long, 10 feet wide and 8 feet high; another a small cross-block on the shore end of the north breakwater 50 feet long, 10 feet wide and 12 feet high, together with fenders and a top course of logs on the portion of new work built last year on the south side of the creek.

Spring tides rise about 48 feet; neaps, 40 feet.

#### SKINNER'S COVE.

Skinner's Cove, Pictou county, is situated on the western side of Northumberland strait, about four miles east of Cape John, and about twenty miles north-west from the entrance into Pictou harbour. It is a small indentation in the coast line, about 750 feet in depth, with a pond at its head, separated from the sea by a beach of sand, some 250 feet wide and 600 feet in length.

On January 5, 1905, a contract was entered into for the sum of \$10,950 for the cutting of a channel through the beach into the pond and for the construction of channel protection works on each side of it.



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The works under contract consist of the excavation of a channel, 15 feet wide at the bottom, 425 feet long and  $2\frac{1}{2}$  feet deep below low water; the construction of pile, brush and stone protection piers, 304 feet long and 15 feet wide, on each side of the channel, and of round timber cribwork blocks, 40 feet long and 20 feet wide, with creosoted timber substructure at the outer end of the protection works.

The construction of the protection was commenced on May 20, and at the end of the fiscal year, the outer end blocks were completed, excepting the placing of cap and upper fenders and sheathing, and forty piles in the inner work were driven.

Expenditure during last fiscal year, \$3,225.14.

## SPRY BAY.

Spry Bay, Halifax county, is a thriving fishing and farming settlement of about 1,000 inhabitants, situated about seventy miles east of the city of Halifax and eight miles west of Sheet Harbour. It contains four stores, two lobster packing factories, hotel and telegraph. The harbour is free from ice all the year round. Hitherto, owing to the absence of a suitable landing pier, the weekly steamer has been obliged to tie up at a flimsy and inconvenient landing, which, owing to shallow water, is approached with difficulty.

In 1903-04, the sum of \$507.94 was expended in the purchase and delivery of timber preparatory to the construction of a suitable wharf.

In 1904-05, the sum of \$1,500 was expended in completing the wharf. The structure is of pile-work 200 feet long by 25 feet wide, having an 'L' on the outer end giving a face length of 55 feet and a depth of water, at L.W.O.S.T., of 11 feet.

Spring tides rise 6 feet; neaps, 5 feet.

## SUMMERVILLE.

Summerville, Hants county, is a village of some 400 or 500, situated on the right or east bank of the Avon river, about midway between Windsor, the county town of Hants and the mouth of the river where it empties into the Basin of Minas. It is about four miles south of Cheverie.

The prosperity of the place is chiefly due to ship building, which up to a few years ago was carried on with vigour and success, but since the decline of the industry the inhabitants have turned their attention to farming, to which the district is well adapted, though there is still a good deal of general ship-repairing done in the yards.

The public wharf was built in 1866, by the inhabitants aided by the provincial government, its dimensions being 275 feet long, 29 feet wide and 20 feet high at the outer end. It is constructed of the ordinary round-log cribwork, well fendered and filled with ballast.

In 1886-87, the work having become almost useless for want of renewals and repairs, Messrs. E. Churchill & Sons of Hantsport, who own and operate a small steamer, making semi-weekly (now daily) trips between Avon river and Basin of Minas ports, repaired the outer end and built an extension, about 36 feet long and 25 feet wide, having on the eastern side an inclined landing for the use of the steamer, when lying alongside at low water.

In 1890, the department expended the sum of \$3,414.52 in removing and rebuilding the decayed top of the work to a height of 5 feet, besides placing new fenders along the whole length and making general and much needed repairs. The work is now 24 feet high at the outer end with 21 feet of water at H.W.O.S.T. (spring tides rise 48 feet; neaps, 40 feet). In 1897-98, the sum of \$100 was spent in a few urgent repairs to the floor.

In 1899-1900, the sum of \$602.08 was expended in renewing the whole floor with guards, planking and stringers, besides bolting in position a number of new fenders.

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In 1904-05, the sum of \$1,532.76 was expended in extending the public wharf by a new block 80 feet long, 25 feet wide and of an average height of 30 feet substantially built of round-log cribwork, filled with ballast and well fendered. A freight shed, 20 feet square was also built for the convenience of local trade. The work was not quite completed at the close of the fiscal year.

The total expenditure to June 30, 1905, is \$9,443.07.

## SWIM'S POINT.

Swim's Point, which is practically a continuation of Clark's harbour, is situate one and one-half miles east of the town proper.

The wharf, as first constructed, consisted of a stone-bank approach, made up of a natural slope rock-bank, 35 feet long, 25 feet wide on top, with a graded covering of 6 inches of good coarse gravel; the wharf proper, which was 178 feet in length, was built of alternate blocks and spans. It consisted of three 10-foot blocks of cribwork, three 18-foot spans and three 10-foot spans. Its width was 20 feet, except the last block which was 40 feet wide, constructed in the shape of an 'L' or return. The height of the outer end was 25 feet; the flooring being 4 feet above H.W.O.S.T.

The people of Clark's Harbour being desirous that the ss. *Sentac*, which plies between St. John and Halifax, touching at intermediate ports of importance, should call here, and as this was the only wharf where she would have sufficient water to dock, asked that the wharf be extended sufficient to accommodate a boat as large as the *Sentac*. The sum of \$1,600 was estimated as sufficient to construct the desired extension.

In 1903-04, the sum of \$1,214.56 was expended on that work, and during the last fiscal year an additional sum of \$307.30 was expended making a total of \$1,521.86.

The work consists of 40 feet of cribwork, 25 feet wide and 29 feet high at its outer end, or about 29,000 cubic feet of solid cribwork, at a cost of 5¼ cents per cubic foot. The work was substantially constructed.

Spring tides rise here 10 feet; neaps, 7 feet.

## SYDNEY QUARANTINE STATION.

The quarantine station in Sydney harbour is on the southern arm, near Keating Point, and about three-quarters of a mile from Point Edward, at the eastern extremity of land lying between the south and west arms.

The wharf, built by the Department of Marine and Fisheries and repaired and extended in 1902-03, is a block and span structure, extending 148 feet to 8 feet at low water. Spring tides rise 5 feet.

In 1903-04, the sum of \$1,551.52 was expended in procuring creosoted timber and other materials to be used in repairing and extending the wharf.

The old wharf having fallen into such a dilapidated condition as to render its reconstruction and extension inadvisable, the appropriation for 1904-05 was made for expenditure in constructing a new wharf, using materials procured in 1903-04. During the year \$1,673.71 of the amount appropriated was expended in procuring the additional materials, required in the construction of a wharf, to extend 173 feet to 10½ feet at low or 15½ feet at high water; consisting of an inner and four intermediate blocks 14 feet in width, and an outer block 20 feet in line of work by 40 feet, and in constructing the inner and three intermediate blocks.

## TITLE PASSAGE.

Title Passage, Guysboro' county, is a narrow boat channel between Durrell island, at the western entrance to Canso harbour and the mainland.

In 1904-05, an offer to remove obstructions, boulders, left at the side of a channel made by dredging a bar near the entrance of Title passage into Canso harbour in 1900 for the sum of \$300, was approved but the work was not performed.

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## UPPER WOODS HARBOUR.

Upper Woods harbour is a village of about 400 population, situate in the south-western part of Shelburne county, about 18 miles east of Barrington, and 40 miles south-west of Yarmouth. It is an inlet from the Atlantic about three miles in length and about half a mile in width, dry at L.W.O.S.T. except in a channel which runs nearly through the centre of the place with a depth varying from 9 to 18 feet at L.W.O.S.T. At the mouth or lower end of this channel there is a rapid or falls of about 2 feet descent, and it is only at H.W.O.S.T. that these falls can be readily passed, so that the harbour is limited for the use of small vessels and open fishing boats only.

There were no wharfs in the immediate vicinity of this inlet at which vessels of moderate draught could call for landing freight, &c., the nearest being four miles to the eastward, or five miles to the westward. This department therefore constructed, in 1899-1900, the following works :—

First, on the west side of the island, known as Smith's island, a pier 77 feet long, 20 feet wide with an 'L' or return of 27 by 20 feet, composed of two blocks of cribwork, 11 by 29 feet, three spans of 13 feet in the clear,  $7\frac{1}{2}$  feet each and a pile trestle work consisting of four pile trestle bents separate, each 8 feet 8 inches, with a width on top of 40 feet. Second, a stone bank 20 feet wide, connecting this pier with the island. Third, a causeway between the island and the mainland, 534 feet long, 16 feet wide and 10 feet high, on the average, comprising trestle work of 44 bents, separate each 10 feet centres, two blocks of cribwork 10 feet by 16 feet, a span 13 feet long and two rock-bank approaches 20 feet wide on top.

During the fiscal year 1904-05, authority was given to expend a sum not exceeding \$100, in repairing this work. Owing to the ice and frost raising some of the pile-work in the causeway, several stringers were broken and a portion of the work was at least three feet higher than its original elevation. These piles were driven down again, several broken stringers and guard-rails were replaced; the work was last spring in good condition. Spring tides rise 10 feet; neaps, 7 feet.

## VICTORIA.

Victoria, King's county, is situated at the mouth of Church Vault brook, on the south shore of the Bay of Fundy, 52 miles north-west of Digby Gut and half way between Morden and Ogilvie's wharf, from each of which it is distant about 4 miles.

The breakwater, which also serves as a landing and loading pier, was begun in 1864 and finished in 1867, at the joint expense of the inhabitants and the provincial government. It is 243 feet long,  $27\frac{1}{2}$  feet wide at the outer end, 23 feet wide at its inner end and 24 feet in height at its outer end.

In 1878, the work was repaired and raised 4 feet. Slight repairs were made in 1891 and in 1893.

In 1900-01, the sum of \$398.81 was expended in renewing 88 feet in length of the crib breakwater, forming the eastern side of the road approach. The new work is from 6 to 10 feet high, from 10 to 15 feet wide, strongly built of round-cribwork, well fendered and fully ballasted. A portion of the flooring of the shore end of the breakwater was also renewed.

In 1902-03, the sum of \$653.53 was expended in refilling with solid cribwork a breach in the shore end of the breakwater that had been made by heavy seas in the spring of 1901. The new patch is 30 feet long, about 18 feet wide and 14 feet high.

In 1904-05, the sum of \$182.39 was expended in filling with cribwork and ballast a hole on the seaward face of the work, about 5 feet square, and the replacing of a few pieces of close sheathing that had been torn off by ice the previous winter.

The total expenditure to June 30, 1905, is \$2,862.97 including a refund to the Provincial Government of \$450 in 1887-88.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

Spring tides rise 36 feet.

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## VICTORIA BEACH.

Victoria Beach, Annapolis county, is situated on the north side of the Annapolis basin, thirteen miles south-west from Granville ferry which is on the north side of Annapolis river, directly opposite the town of Annapolis. It is four miles north-east from the town of Digby and about a mile and a half to the north-east of the entrance of Digby Gut. The whole distance from Granville ferry to Victoria beach, thirteen miles, and for another two miles down to Digby Gut, is a thrifty and well-settled farming and fishing district. Victoria Beach is the terminus of the Middleton and Victoria railway, now under construction, a part of the Halifax and South Western railway system.

On June 15, 1904, a contract was entered into between the Department of Public Works and Messrs. Reid and Archibald of Halifax, in the sum of \$93,890, for the construction of a pile-work pier for general utility and to serve as a terminus for the Middleton and Victoria Beach railway. The total length of the structure when completed will be 1,350 feet; it has a width of 50 feet and a height along the whole length of the 'L' of 57 feet. The 'L' is 350 feet long and at L.W.O.S.T. will carry a depth of 25 feet of water. Spring tides rise  $27\frac{1}{2}$  feet, neaps 23 feet.

The pier is constructed of pile-work, the bents, of seven piles each, being spaced 9 feet apart in the length of the work. The total number of bents is 153 of which the piles in the first 40 are of native spruce and the outer 113 bents of creosoted Virginia pine. Caps, stringers braces, walings and guards are all of Georgia pine; the flooring of native spruce 6 inches thick.

On June 30, 1905, the total value of work done was \$66,016.60.

## WALLACE HARBOUR.

Wallace harbour is situated on the south side of the Straits of Northumberland about midway between Pictou harbour and Bay Verte. It is at the mouth of Wallace river and is well sheltered from all winds. On the south side of the harbour at a point where the harbour is slightly more than  $\frac{1}{2}$  mile in width, is situated the village of Wallace with a population of about 800.

The industries of the place are farming, fishing, and quarrying freestone of which there are large and valuable beds in this vicinity.

On the north side of the harbour there was, many years ago constructed a landing to accommodate the ferry service across the harbour. This landing was inadequate, and in 1879 the department dredged a channel for use of ferryboats during all times of tides. This subsidiary channel was about 1,600 feet long, 45 feet wide and 7 feet deep at L.W.O.S.T.

To prevent the inner end of this channel from filling in and also to afford special facilities to the people of North Wallace and Fox Harbour, the department in 1888-89, constructed a wharf starting from the shoreward end of the public ferry road, running past the remains of the old landing, along the seaward side of the subsidiary channel, for a distance of 165 feet. In 1889-90, this work was extended a further distance of 180 feet with a width of 20 feet, the last 20 feet of which is 40 feet wide and in the shape of an 'L' or return.

During the fiscal year 1900-01, the sum of \$498.38 and the next year, the sum of \$250, were expended in effecting necessary repairs to this work.

On the south side, or at Wallace village, there is also a wharf constructed by this department in 1897. The distance between these two wharfs is about 2,350 feet about 1,400 feet from the end of the north wharf, to the channel, 750 feet across the channel and 200 from the end of the south wharf to the channel. The distance from the channel to the south wharf was also dredged, but this dredging has filled in so that now the ferry boats can ply only at certain times of tide.

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The people have been demanding better service and in consequence of their wishes the department, this last year, has been extending the north wharf to the channel, the distance of 1,400 feet, and at the end of the year had practically all the piles driven, except the fender piles, a portion of the caps, stringers and flooring. After this is completed, it is the intention of the department to extend the south wharf its requisite 200 feet or thereabouts, thus having nothing but the narrow channel to cross, which can be done at all times of tide.

Spring tides rise here 7 feet, neaps  $4\frac{1}{2}$  feet. The expenditure during the last fiscal year is \$3,980.26.

## WASHABUCK CENTRE.

Washabuck, Victoria county, is a district on the south side of the eastern end of St. Patrick's channel, an arm of the Bras d'Or lakes, and extends about six miles along the shore. Washabuck Centre is situated near the centre of the district.

In order to facilitate the shipment of agricultural produce and cattle from the district, during 1903-04 a wharf was constructed by the department at this place. The wharf is a block and span structure, 218 feet long, extending to 12 feet at low water, and is 20 feet wide, with an 'L' at the outer end, 20 by 20 feet; it is connected with the public road by a road 102 feet long and 20 feet wide, fenced in on each side. The blocks and the shore abutment are constructed with round timber substructure, and the two outer blocks are protected by close-sheathing on their outer faces.

During 1904-05 the sum of \$147.27 was expended constructing a warehouse on the outer end of the wharf. The building is 16 feet in length, 10 feet in width and 7 feet in height of post; it has a two inch spruce flooring, one door 6 feet wide and a small window at end, and the roof is cedar shingled.

## WEDGE POINT.

Wedge Point, Yarmouth county, is the southern extremity of the peninsula called 'Tusket Wedge', three miles long north and south, by half a mile to a mile wide, east and west, situated some 10 miles south-east from Yarmouth, the county town. The population of the peninsula comprises some 500 people, the majority being engaged in, and more or less dependent upon, the fisheries. On the east side of the peninsula, there was no shelter or protection whatever for the fishermen, of whom there are a considerable number and they were obliged to keep their boats in Goose bay, on the western side.

In 1902-03, the sum of \$1,000 was expended in commencing the construction of a breakwater. The work built was 119 feet long, 19 feet wide and from 5 to 12 feet high; it is substantially built of round-log cribwork, well fendered and ballasted and close-sheathed on the seaward side.

In 1903-04, the sum of \$1,701.61 was expended in building an extension to the breakwater built in 1902-03. The new block is 100 feet long, 19 feet wide on top and from 12 to 15 feet high, well and substantially built of cribwork, sheathed on the seaward side and filled solid with stone.

In 1904-05, the sum of \$2,367.47 was expended in extending the breakwater by a block of substantial cribwork 100 feet long, 19 feet wide on top and from 14 to 16 feet high. On the seaward face the work is close-sheathed and provided with a break  $4\frac{1}{2}$  feet high.

The total expenditure by the department to June 30, 1905, is \$5,069.05.

Springs tides rise 12 feet, neaps 10 feet.

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## WEST ARICHAT.

West Arichat is a small but safe harbour on the south side of Isle Madame, sheltered from the south and west by Creighton island and by a breakwater between it and the mainland.

The breakwater is 1,211 feet in length. A portion of it, extending 888 feet from the island, was built by the provincial government in 1867 and the remainder by the department in 1874. It is of round timber open-faced, and was fully ballasted. The top of the covering is 11 feet above the bottom, which dries at low water, except near a 25 feet opening between the old and new works, and 6 feet above high water.

The appropriation was for renewing the floor-stringers and covering in places and for repairs on each side of the opening, including repairing and strengthening the work on the west side and reconstructing a portion of the work on the east side.

During 1904-05 the sum of \$848.40 was expended in procuring the materials required, and in reconstructing the work on the east side of the opening.

## WEST ARICHAT WHARF.

West Arichat, Richmond county, is a large settlement on the south side of Madame island, about three miles to the westward of the town of Arichat.

The harbour is easy of access and perfectly safe, being sheltered from the south and west by Creighton island, and by the breakwater between the island and the mainland.

The sum of \$3,000 was voted for expenditure during 1904-05, towards the construction of a wharf at Rosdet Point, on the northern entrance to the harbour; on May 23, 1905, a plan and specification for the proposed wharf were submitted for approval.

The proposed work consists of a block and span wharf, 88 feet long and 20 feet wide, with an 'L' on the eastern side of the outer end 28 feet long and 24 feet wide, and of a cribwork approach 300 feet long and 16 feet wide, to connect the wharf with the public road. The cribwork approach is to be constructed with round timber, filled in with stone and gravelled on top, and its faces are to be sheathed. The blocks are to be built of round timber, with creosoted substructure, properly ballasted and fendered, and the outer faces of the outer block to be close-sheathed, between the fenders.

Up to the end of the fiscal year tenders for the work had not been called.

## WEST BAY (SOUTH).

West Bay (South), Richmond county, is situated on the south side of West bay, the south-western arm of the Great Bras d'Or lake.

'The Points,' so-called from the number of headlands projecting into the south side of West bay, is a scattered settlement, extending along the shore for a distance of four miles, and the centre of the settlement is about twelve miles eastwardly from West Bay port, at the head of the bay, and fifteen miles northerly from the St. Peter's canal.

On September 1, 1903, a contract was entered into, for the sum of \$2,980 for the construction of a wharf, 250 feet long and 20 feet wide, at 'The Points,' inside of Pringle island.

The work under contract consisted of a cribwork shore abutment 20 feet long, and of a creosoted pile-wharf 230 feet in length.

Construction was commenced on June 13, 1904, and up to the end of the fiscal year 1903-04, all the bearing piles were driven and capped, the outside floor-stringers were placed and secured, the outer 12 pile-bents were braced and the cribwork abutment was placed and partly ballasted.

The work under contract was completed and accepted on July 26, 1904.

Expenditure during last fiscal year, \$1,335.



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## WEST BERLIN.

West Berlin, is a fishing settlement situated about nine miles east of Liverpool, with a population of about 400. The inner cove, in which the fishermen found shelter for their boats, was separated from the Atlantic by a shingle beach about 800 feet in length. As the destruction of this beach was threatened, the department in 1899-1900, constructed a piece of beach protection composed of stone-filled, round-log cribwork, 387 feet long, 6 feet wide on top and varying in height from 5 to 10 feet. The total cost was \$1,484.43.

This beach beyond the end of this protection again washed away, and it was found necessary to protect the work in order to render this practically impossible of recurrence.

During the last fiscal year the department expended the sum of \$1,304.66 in constructing this extension. The new work is 240 feet long, 8 feet wide on top 12 on the bottom, and has an average height of 9 feet, and contains approximately 21,600 cubic feet of cribwork, stone-filled to the top, well fendered and fastened.

Spring tides rise 7 feet, neaps 5 feet.

## WEST CHEZZETCOOK.

West Chezzetcook, Halifax county, is situated on the western side of Chezzetcook inlet, which lies about sixteen miles east of Halifax harbour. The inlet is from half to three-quarters of a mile wide at the mouth, it extends five miles inland and receives the discharge of several small lakes at its head. The population of this village is from 700 to 1,000, located in a scattering manner along the west shores of the inlet. The chief pursuits of the people consist of fishing, farming and some lumbering.

The inlet itself, which has an average width of one mile, is shallow, with a bottom of sand and mud so that at low water there are extensive flats laid bare. There is, however, a narrow tortuous channel running to the extreme head of the inlet with a depth of from 6 to 8 feet at L.W.O.S.T. which is used by numerous fishing schooners, coasting schooners and other small craft such as three and four hand fishing boats and skiffs.

Owing to the gradual filling up of the entrance to the channel with accumulations of sand, a breakwater or mole was constructed by this department in 1892, at a cost, by contract, of \$11,160.97. This work was designed to create a scour to deepen and improve the navigation of the entrance to the channel. It is built in a westerly direction from the foot of the southern end of Conrod's island, which forms the western side of the western channel entering the inlet. At this point the channel from high water to high water was 1,500 feet wide, therefore from the end of the breakwater to high water is now only 600 feet. This great contraction of the channel had the effect of creating a strong current at ebb and flood tide, and the fine sand along the face of the work was scouring to such an extent as to cause the whole length of the 'L' to settle from 4 to 6 feet and the stem of the work, or the seaward 900 feet from 2 to 4 feet, this scouring necessitated the placing of a substantial toe of brush and stone along both sides of the whole work.

The breakwater has a length of 1,100 feet of which 900 feet is at right angles to the channel and the remaining 200 feet or 'L' parallel to it. At the southern end of the 'L' is a square block 30 by 30 feet which is close-sheathed with vertical sheathing 5 inches thick. The rest of the work was ordinary open cribwork, stone-filled, with sides battering 1 in 5 and a top width of 15 feet.

In the spring of 1895, severe storms damaged 363 feet of the top of the work. In September of the same year \$500 was expended in repairs and renewals; five logs in height for a distance of 363 feet were taken apart and rebuilt. In the fall of 1897

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similar damage was done, showing that the work is located in the wrong place and that the seaward side should have been close-piled or sheathed in order to protect it. In the summer and fall of 1898, the sum of \$999 was expended in reconstructing a length of 235 feet of the breakwater from 2 to 4 logs high, whilst a length of 288 feet was sheathed. This was not sufficient, for in January, 1900, the part not sheathed was lifted and partly destroyed over a length of 175 feet. The sum of \$300 was expended during the fiscal year of 1900 in partially repairing this damage. In 1900-01, these repairs were completed at a cost of \$496.59. The work was thoroughly sheathed and the covering entirely renewed. Besides this the outside of the breakwater has been rip-rapped with a toe of stone and brush in order to catch the drift sand. This stone and brush has effectually accomplished its purpose and the sand which had accumulated to a large extent will prove a protection to the main portion of the breakwater.

In 1904-05, the sum of \$2,931.79 was expended in extending the 'L' of the breakwater. The work consists of first, 80 feet in length of stone and brush embankment, 20 feet high, extending up to within 1 foot of L.W.O.S.T. This has been surmounted by a substantial block of cribwork 12 feet wide, 6 feet high and 40 feet long.

Total expenditure to June, 1905, is \$17,215.57.

#### WEST WOODS HARBOUR.

West Woods harbour, is a small village of about 200 people situated about two miles directly west of Middle Woods harbour. The people here had no means of landing their goods, except to drive about 6 or 7 miles, and truck their fish or produce there, returning to their homes with their purchases.

During the fiscal year 1903-04, this department expended the sum of \$686.93 in partially constructing a wharf.

During last fiscal year, a further sum of \$292.82 was expended in completing the structure, making a total expenditure of \$979.82.

The wharf consists of a rock-bank approach, 18 feet in length, a clear span 15 feet in length, a cribwork block 20 feet in length, another clear span of 15 feet and block 20 feet, with an 'L' or return at its head, 18 feet long and fourteen feet wide. The rock-bank is 24 feet wide, and 9 feet high, whilst the remainder is 20 feet wide not including the 'L' or return which is 14 feet wide or 34 feet wide over all with a height at the outer end of 16 feet.

The outside end of the wharf is directly at the inner edge of the channel and easy of approach at all times of the tide. Spring tides rise 10 feet; neaps, 7 feet.

#### WHITE HEAD.

White Head, Guysboro' county, is a fishing settlement on the western side of White Haven, one of the finest harbours on the southern coast of Nova Scotia, situated about fourteen miles to the westward of Canso.

The sum of \$4,100 was voted for expenditure during 1904-05, towards the construction of a wharf at White Head, 168 feet in length and 20 feet wide, with an 'L' on each side of the outer end, 20 x 20 feet, forming a 'T,' and extending to 16 feet at low water.

Plans and specification for a block and span wharf to be constructed of round native timber, excepting the shore abutment 60 feet in length, which is to be of stone, were prepared. Arrangements were made for the delivery of the timber required, on the opening of navigation, but could not be delivered by the end of the fiscal year.

Out of the amount voted, the sum of \$980.23 was, however, expended in the construction of the stone abutment and in procuring the iron required for the work.



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## WHITEWATER.

Whitewater, King's county, is a small farming and lumbering settlement of 200 or 300 people, situated on the west coast of Minas basin, about three-quarters of a mile south of Cape Blomidon, and ten miles north-east of the village of Canning. In 1897-98, the department built a public wharf at a cost of \$3,999.08, by day labour. It is 285 feet long, 20 feet wide, with an 'L' at the outer end 35 feet long, where at high water ordinary spring tides there is a depth of 17 feet of water. The wharf is constructed of block and span work, the blocks solid cribwork, 19 feet long in the stem of the wharf, the spans being 14 feet in clear opening.

In the fiscal year 1901-02, the sum of \$249.95 was expended in building a block of cribwork 40 feet long, 10 feet wide and 12 feet high, on the northern side of the shore end of the work, to replace an ancient and dilapidated block that retained the bank forming the approach.

In 1902-03, the sum of \$881.98, was expended in filling the two outer spans of the block and span wharf, with solid cribwork to full height and half width, *i.e.*, 11 feet by 18 feet to 19 feet high, and constructing a small block about 10 feet square and 10 feet high, of the shore end, to act as a retaining wall for the approach.

In 1904-05, the sum of \$404.24 was expended in renewing the whole floor of the wharf, including some few new stringers and guard-timbers.

Spring tides rise 40 feet, neaps 34 feet.

## WHITE'S COVE.

White's Cove, Digby county, is a settlement of some 200 or 300 people, engaged in fishing and farming, situated on the shore of St. Mary's bay, about five miles south of Weymouth.

In 1903-04, the department expended \$1,804.63, in extending and repairing an ancient wharf of cribwork. The new block is 38 feet square and from 18 to 20 feet high, substantially built of round-log cribwork. The next 100 feet in length shoreward was also taken down and rebuilt and the whole wharf, 260 feet long, was levelled up with gravel.

In 1904-05, the sum of \$1,004.01 was expended in extending the breakwater by a new block 30 feet long, 38 feet wide, from 19 to 21 feet high, substantially built of cribwork of the usual type.

## WHYCOCOMAGH.

Whycocomagh is a village on the south side of a bay of the same name, at the head of St. Patrick's channel, an arm of the Bras d'Or lake.

A private wharf at this place was purchased together with a warehouse and a right of way to the public road, in 1897-98, and repaired and extended during the year 1898-99. It is 228 feet long, including 144 feet of stone work, 21 feet wide and 84 feet of pile-work (25 feet wide over 59 feet of its length and 60 feet wide over the outer 24 feet) built over the remains of an old block and span structure. The depth at the outer end is 12½ feet at low or 13½ feet at high lake level.

In 1902-03, the sum of \$450 was expended in repairing the sides and ends of the outer 50 feet of the approach, and in blocking up and repairing the floor of the warehouse.

During the fiscal year 1904-05, the sum of \$499.98 was expended in completing repairs to the wharf undertaken in 1902-03, in renewing the covering of the outer end or 'head' in raising the approach and in repairing the warehouse.

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## WINDSOR.

Windsor, Hants county, is the county town of Hants and has a population of about 4,500. It is an important town situated at the head of the estuary of the River Avon, on the Dominion Atlantic railway, forty-five miles north-west of Halifax. In the neighbourhood are extensive quarries of gypsum, of which 120,000 tons are annually shipped to the United States. Some two or three million feet of lumber, B.M. are annually exported by water. Up to a dozen years ago the wharfs of the town were comparatively free from mud, and at high water, large vessels could lie alongside and discharge or load. In the last few years, owing partly to the construction of the new highway bridge, the mud had accumulated in front of the wharfs to such an extent that it is only at extreme high tide that moderate sized vessels can approach or leave the wharfs.

With the object of scouring away the accumulated mud, the department in 1897-98, began the construction of a training weir, extending down stream from the corner of the Falmouth abutment of the road bridge at an angle of 45 degrees with the bridge. The weir is constructed of brush mattresses at the bottom, with sufficient stone to keep them in place, and with cribwork on top of them. The thickness of the brush mattresses, with their load of stone, is from 2 to 4 feet, the average depth of the main or under-crib is from 5 to 8 feet and the uniform height of the 'A' shaped top crib is 7 feet, the sloping sides of the work are sheathed with 3-inch hardwood plank, and the crest is covered with 6 by 6 by  $\frac{3}{4}$  steel angle, securely bolted. The work is built on shifting quicksands and owing to the great rise and fall of the tides (about 40 feet) and the great velocity of the current at ebb and flood tide, it was constructed under great and peculiar difficulties.

In the fiscal year ending June 30, 1901, the sum of \$2,173.74 was expended in completing the work to its originally designed length of 600 feet.

In the fiscal year ending June 30, 1902, the department expended the sum of \$2,725.93, in extending the work a further distance of 100 feet and in making repairs.

In 1903-04, the sum of \$98.71 was expended in replacing a small quantity of the hardwood sheathing on the outer end of the work that was torn off by ice in the previous winter.

In 1904-05, the sum of \$53.07 was expended in replacing some more of the hardwood sheathing of the training weir that was torn off by the ice in the previous winter.

Spring tides rise about 40 feet; neaps, 36 feet.

## WOLFVILLE.

Wolfville, King's county, is a town of about 2,000 inhabitants, situated on the right bank, and near the mouth of the Cornwallis river, which issues into the Basin of Minas at its south-west corner. It is an important station on the Dominion Atlantic railway, half way between Annapolis and Halifax, sixty-six miles from Annapolis and seven miles east of Kentville, the county town of King's.

In 1900-01, the department, at a cost of \$6,360.50, built by contract a public wharf on the right bank of the river, near its mouth, at a distance of about half a mile from the town. The approach consists of an earthwork embankment, 144 feet long, 25 feet wide and of an average height of 5 feet. The wharf itself which was substantially built of pile-work was 152 feet long, 36 wide, including an inclined slip on the south side 10 feet wide. It has an 'L' on the outer end 82 feet long, giving a total face length on the river channel of 116 feet, the 'L' is 40 feet wide and is from 28 to 29½ feet in height along the face, giving a depth of water at H.W.O.S.T., of about 46 feet. At L.W.O.S.T., the river channel carries a depth of from 4 to 6 feet of mostly fresh water.

In 1902-03, the channel of the river moved shorewards owing to erosion, a distance of some 20 or 30 feet causing the two outer rows of piles of the wharf to lose more than half their hold in the mud and sand. In consequence of this it became

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necessary to build cribwork in the spaces between the two outer rows of piles at the end of the 'L,' and on the opposite end of the wharf, alongside the inclined slip. This mode of treatment being insufficient and the scour continuing, it was decided to remove the outer 20 feet in width for the whole 118 feet in length of the wharf, and rebuild it on the inner side of the 'L.' The work was begun on October 1, 1903, and vigorously carried on until December 24, when, owing to the severity of the weather and the rapidly accumulating ice; operations were suspended.

The winter of 1903-04, was the severest known for a great many years. Ice formed in and around the piles of the wharf to a greater weight and thickness than had been known since the wharf was built. The floating power of the ice, added to the reduced hold of the piles in the bottom, from the erosion of the channel, caused the whole 'L' to be lifted up by an exceptionally high tide of the third March, 1904, to a height of from 5 to 8 feet. A few days later the whole outer portion of the wharf, including the 'L,' was carried away and destroyed.

In 1903-04, the sum of \$1,768.89, was expended in the above alterations and improvements and after the destruction of the wharf, in saving such of the timber as was possible.

In 1904-05, the sum of \$78.80, was expended in saving and booming old timber from the destroyed pile-wharf and the sum of \$2,565.11 in beginning the construction of a substantial cribwork wharf in its place. At the close of the fiscal year the work was about one-third completed.

Spring tides rise 48 feet, neaps 40 feet.

## YARMOUTH BAR.

Yarmouth, the county town of Yarmouth county, is situated on the south-western extremity of Nova Scotia. It is a thriving and prosperous town of nearly 7,000 inhabitants, and, next to Halifax, the largest and most important in Nova Scotia proper. It is the terminus of the Dominion Atlantic railway, whose fine Clyde-built steamers make regular trips throughout the year to Boston. There are several important manufactories in the place, but the leading business is shipping, of which a larger tonnage is owned here than in almost any locality in Canada.

At low water, Yarmouth harbour, in which spring tides rise 16, neaps 13 feet, consists largely of mud flats covered with eel grass. The harbour is formed by a succession of shingle or gravel beaches (called Stanwood Beaches), aggregating about one mile in length, which connect the northern end of Cape Fourchu island, also about a mile long, with the southern end of Stony point on the main land, and separates the harbour from the Bay of Fundy.

In 1867, it was found that part of the beach between Cape Fourchu and Stony point, was gradually wearing down and unless the action was arrested, the sea would eventually sweep away the beach and destroy the harbour. The government of Nova Scotia began the work of protecting the beach in 1867, constructing 200 feet of cribwork at Stony point. Between 1873 and 1875 the Public Works Department constructed the remaining 2,800 feet of protection work required to reach Cape Fourchu and added buttresses or groynes to stop the movement of the gravel.

Between 1875 and 1878 the protection works, though substantially built of stone-filled cribwork and close-piled on their seaward faces, had to be repaired and strengthened, the expenditure amounting to over \$23,000.

Between 1888 and 1896, no further works of repairs were undertaken on the beach protection, and it became dilapidated and decayed. Breaches were made through it by the sea in various places. During the year 1896-97, the sum of \$2,933.62 was expended in carrying on the most urgent works of repair, and in 1897-98, a further sum of \$3,234.51 was expended in continuing and completing these repairs. This last sum was applied in rebuilding a length of 50 feet at the eastern end of the protection work and in constructing a groyne, projecting at right angles from the

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same end, for a distance of 175 feet. The groyne is 25 feet wide and 11 feet high, substantially built of round-log, stone-filled, cribwork. Its object was to protect the beach at the north-eastern end of the main cribwork protection by accumulating the gravel and breaking the waves before they expended their force on the beach. It has admirably fulfilled its purpose, as gravel has accumulated at the junction of the groyne with the main work to a depth of over 14 feet.

In 1898-99, the sum of \$300 was expended in repairing a small but serious breach 25 feet long, in the bottom of the outer face of the beach protection work, and with covering with 3-inch hemlock plank a length of 430 feet of the top of the work, in order to prevent the ballast from being washed out by the waves.

In 1899-1900, the sum of \$970.27 was expended in repairing two or three small but dangerous breaches in the seaward face of the work, and in covering the top for a length of about 670 feet with 3-inch plank to prevent the sea from washing out the ballast.

In 1900-01, the sum of \$3,859.70 was expended in extensions and repairs, the individual expenditure for the work done being as follows :

(a) \$142.43 was expended in repairing and filling with ballast a length of 60 feet of the older portion of the work.

(b) \$2,798.50 in extending the work 514 feet westerly ; this new length was 8 feet wide, from 5 to 8 feet high, substantially built of round-log cribwork, sheathed on the seaward side and covered on top with round spars well spiked on.

(c) \$448.77, in rebuilding a length of 50 feet of the older portion of the work, near the eastern end, which was severely damaged by a heavy sea, November 8-10, 1900.

In 1902-03, the sum of \$120.94, was expended in a few petty and miscellaneous repairs to the beach protection work, the work done comprising the replacing of a few pieces of close-sheathing washed off by winter seas, the renewal of some flooring and the re-spiking of loose portions.

In 1903-04, the sum of \$325.57 was expended in building a fence on both sides of the beach protection, 1,250 feet long, for the purpose of making it safe for horse traffic.

A few minor repairs to the beach protection work were also made.

In 1904-05, the sum of \$948.32 was expended in general and miscellaneous repairs. Spring tides rise 15 feet; neaps, 12 feet.

## PRINCE EDWARD ISLAND.

### BAY FORTUNE.

Bay Fortune harbour, King's county, is situated on the south side of Rollo bay, on the east coast of the island and about five miles south-west from Souris, the eastern terminus of the Prince Edward Island railway.

To improve the channel leading to the wharfs, situated on each side of the mouth of the 'Bay Fortune river,' the provincial government, some years ago, built a short breakwater on the eastern side, so as to contract the channel and thus increase the scour and deepen the water over the sand bar obstructing the entrance. During 1892-93-94, the department extended the breakwater, repaired the inner or original work and connected it with the wharf, on the point of the beach, thus extending the work to a total length of 850 feet, with widths varying from 12 to 20 feet.

Much benefit being said to have resulted from the work; the water over the bar being improved, permitting of a larger class of vessels, as was desired, entering for cargoes.

During the fiscal year 1904-05, the sum of \$449.04 was expended in reballasting the breakwater, where settlement and washout had occurred, and building a brush and stone beach protection work at inner end of breakwater, for a length of 500 feet, where there was danger of a new channel forming.

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## BAY VIEW.

Bay View, Queen's county, is situated on the eastern side of, and near the mouth of the Hope river, which enters New London harbour, about three and half miles south-east of the harbour's entrance.

The pier, one of those which was assumed by the Dominion government in 1883-84, is 509 feet in length; the 409 feet outwards from the shore being from 18 to 20 feet in width, then increasing gradually to a width of 35 feet at the outer end, where a depth of 10 feet is carried at low water spring tides, or of  $14\frac{1}{2}$  feet at high water springs, which rise  $4\frac{1}{2}$  feet.

When assumed by the department the pier was in very bad condition, and being as well of poor construction, repairs are about yearly required to keep it in fit condition for traffic; while not exposed to any heavy sea, extreme high tides when occurring during storms usually cause damage, as was the case on November 14, 1904. An expenditure of \$673.79 was required to repair and strengthen during the past spring; general repairs being required over all of the work, in addition to which, a timber protection 'break' was built on seaward side, protected with fender piles, &c.

## BEACH POINT.

Beach Point, King's county, is on south side of entrance to Murray harbour. From the 'point' which is close to the channel, a sand spit extends in a westerly direction, along the edge of the channel, about a mile, inclosing between it and the shore a basin carrying from 3 to 5 feet at low water, affording good shelter and anchorage for fishing boats. The sand spit or bar, dry at low water, and having a width of about 500 feet protects it from any sea.

To render this shelter available, a cut was made through the bar during the winter of 1904, by the use of a mud digger, worked from the ice. The channel so dredged is 575 feet in length and 10 feet in width.

During the past winter the channel was widened and cleared out, giving now a total width of 20 feet, and so far, has proved most satisfactory, being a great benefit to the fishermen of the locality.

The amount expended during the fiscal year was \$471.27. Total expenditure to date \$805.76.

## BELFAST PIER.

Belfast Pier, Queen's county, locally known as 'Haliday's Wharf,' is situated on the south side of Orwell bay, about one mile from the village of Eldon.

This pier, constructed by the government of Prince Edward Island previous to confederation, was taken over by the federal government in 1883. Besides affording shipping facilities for the neighbourhood, it is also the port of call for a passenger steamer plying, during the season of navigation, tri-weekly, between Charlottetown and other ports on Orwell bay, &c. It has a length of 600 feet with return or 'L' of 145 feet, the inner 440 feet has a width of about 27 feet, and the outer 160 feet and 'L,' a width of from 30 to 32 feet. The 'L,' or pier head, has on its inner and outer side as well as eastern end, a depth of 8 feet at low water spring tides, or of 17 feet at high water. Dredging was done to that depth by the department, during summer of 1903, giving good approach to the pier, and a safe berth for vessels, on the inner side of the return.

During the past season the sum of \$1,749.40 has been expended; in the reconstruction of a length of 190 feet, of the inner part of the eastern face; of 145 feet of the western face, and effecting general repair over all of the inner 440 feet of the work which has become, by age and decay, quite unsafe.

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## CAMPBELL'S COVE.

Campbell's Cove, King's county, is on the north side of the island, about 9 miles from East Point, and 14 miles north-west from Souris, the eastern terminus of the Prince Edward Island railway.

This place was in 1872 selected by the provincial government for the construction of a small breakwater, 300 feet long and 30 feet wide, on the reef that extends from the west side of the cove ; its inner end being 70 feet beyond high water mark ; much benefit being derived from the work, both by the fishing and farming industries of the district.

The Dominion government took over this breakwater when Prince Edward Island entered confederation. In 1882-83 necessary repairs were made and the work was extended 250 feet seawards, and a gap of 70 feet, between its inner end and the shore, filled in, making the work in all 620 feet long. This breakwater sheltered a small area carrying a depth of about 4 feet of water at low tides, or 8 feet at high water springs, which here rise about 4 feet. The old breakwater remained in good condition up to 1899, when some slight repairs were required, after that date, however, owing principally to the ravages of the 'teredo,' each storm caused more or less damage to the cribwork, and notwithstanding the extensive repairs made in 1895, the work continued to suffer each fall and winter. In 1899 a length of 80 feet of the original work was completely carried away, and an adjoining length of 50 feet so badly damaged, as to require reconstruction. This latter damage was made good in 1900-01, and the outer part of the work, destroyed in 1896, was rebuilt in 1901-02.

During the severe storm of November 14 last, the inner portion of the breakwater suffered damage to the covering and floor stringers ; some ballast was washed out, and a length of about 50 feet of seaward face was injured. Materials for necessary repairs were procured during the past winter, at a cost of \$471.09.

## CANOE COVE.

Canoe Cove, Queen's county, is situated on the south coast of the island about 18 miles by water from Charlottetown, and 10 miles from Crapaud. There is fairly good shelter from winds from south-east to west, protection being given by a reef extending from the west side of the cove ; but it is, however, exposed to the south and south-west winds.

The construction of a breakwater was commenced in the spring of 1901, and continued until July 1, 1903. Materials were procured during winter, and the construction carried on during summer and fall months. The work was done by day labour, under a foreman, who had built, in July, 1903, a length of 200 feet, one-half of which was finished, while the outer 100 feet required 2 feet of its height, flooring, sheathing of sloping face, &c.

The work, as built, is an isolated block being about 500 feet from the point, on the eastern side of the cove ; it runs nearly due west out to a depth of about 5 feet at ordinary low water, or of about 13 feet at high water spring tides. At its bottom the width is about 32 feet, and up to one foot above low water, both the inner and outer sides have a batter of 1 in 12 ; on the inner side this batter is continued to the top, but the outer, or seaward side, has a slope of 1 in 1 and is to be sheathed, with 4-inch thick hardwood plank. The top of the work has a width of 19 feet, and is about 5 feet above ordinary high water spring tides.

Since July 1, last, the outer 100 feet of the work, mentioned as being unfinished, has been completed, having been built up the required 2 feet ; the sheathing of the sloping face, flooring, &c., was put on at a cost of \$764.88 which with outstanding accounts unpaid for previous work, and amounting to \$223.30, made the total expenditure for the work \$988.18.



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## CHINA POINT.

China Point pier, Queen's county, is situated on the west side of the Orwell river, near its entrance into Orwell bay.

Originally built by local government, its control was assumed by the Dominion government in 1884; it has in all a length of 426 feet, consisting of a shore abutment or approach 140 feet long, six blocks with intervening spans, and a pier head fronting 72 feet on the channel, and having a width of 37 feet, and a depth of 15 feet at low water, or 23 feet at high water spring tides, which here rise 8 feet.

Being a very old structure when assumed by the Dominion government, reconstruction of its pier head has since been necessary, and from time to time, repairs to the inner portion were required to keep it in passable condition.

Repairs are now necessary to the first inner block and connecting spans, and at the close of the fiscal year materials required for those repairs had been purchased at a cost of \$294.77.

## GRAHAM'S POND.

Graham's Pond, King's county is situated on the east coast of the island, about five miles south of the entrance to Cardigan bay, and about the same distance north of Murray harbour. The pond has a length of about half a mile, and a width of from 600 to 800 feet, carrying in the body of the pond, and a short distance from the entrance, a depth of from 5 to 7 feet of water at ordinary pond level, which was usually  $1\frac{1}{2}$  to 2 feet higher than ordinary low water, and 3 to  $3\frac{1}{2}$  feet below high water spring tides, which here rise 5 feet.

During the summer of 1900, a new channel was opened into the pond by the Marine and Fisheries Department (existing one having gradually worked to the south where the outlet passed over a reef) with the view, if possible, to admit of boats entering the pond at all stages of the tide, but the new cut was found on the occasion of the first north-easterly storms to be filling in again, and working back to what had been its former position.

In the fall of 1901, by the instruction of the department, the cut made by the Marine and Fisheries Department was cleared out, and a protection of brush, stone and piling placed at its entrance. This work proved effective in keeping the channel in the course desired, and besides, in giving some small place of shelter for boats.

Extension of the works has since been made each year, sums of \$500 being expended each in 1902 and 1903, and a similar amount during the past season, when lengths of 60 feet were added to the outer ends of the cribwork or piers, on either side of the new channel. The piers each have now a length of 340 feet and width of from 15 to 20 feet.

## GRAND RIVER.

Grand River wharf, Prince county, is situated on the north side of the Grand or Ellis river, near its mouth, where it enters Richmond bay, about seven miles north-east from Wellington station, on the line of the Prince Edward Island railway.

This pier was constructed by the Prince Edward Island government during 1880-81-82, at a cost of \$4,618.60. It originally had a length of 654 feet with width of 22 feet, consisting of a shore abutment or approach 530 feet long, and two 'blocks' with intervening 'spans,' 25 feet each; the 'blocks' being respectively 31 and 44 feet long. The work was constructed of square timber close-faced, and filled in with brush, stone, &c.; the roadway, excepting on the outer block, which was floor stringered and planked over, was formed of clay and gravel filling.



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Some eight or nine years ago the work became unserviceable, the outer block being carried away, and the filling, in the shore abutment, either washed out or so settled as to render passage over it impossible, and requiring reconstruction of the greater part of the work.

As the local government was unwilling to undertake the necessary repairs, the property was transferred to the federal government, in the fall of 1902, which then assumed its control. An appropriation of \$1,500 was granted by parliament towards its reconstruction and repair, which work was commenced in the spring of 1904, and by the end of June of that year, all of the shore abutment had been placed in good condition. Plan and specification were then prepared and tenders received for the reconstruction, repair, &c., of the outer portion of the wharf, and this was awarded to Messrs. McNeill, Arsenault and Pembroke, for the sum of \$3,155.

Work was commenced in early spring and by end of fiscal year was well under way, being built up to within one foot of high water, or equal to two-thirds completed.

#### MIMINIGASH HARBOUR.

Miminigash harbour, Prince county, is situated on the north-west coast of the island, about 15 miles from North Cape, and 18 miles north of West Point.

Before its improvement by the department it was one of the numerous ponds along the coast, having channels emptying into the Gulf of St. Lawrence, often changing position, and at times, when very severe storms occur, becoming completely closed, as they pass through low sandy beaches.

However, the entrance to Miminigash pond was to some extent sheltered by 'Miminigash Reef,' a ledge of rock nearly a mile long, lying parallel to the shore, about a half mile distant, it had much advantage over the other ponds along the coast, and so after its examination, and that of the other ponds proposed as sites for the formation of a harbour, it was selected by the department.

Work was commenced in 1878, and now consists of piers or breakwaters, on either side of the entrance (position of which has been made permanent) and confining its width to 56 feet. The breakwater on the north side is 550 feet long, and the one on south 350 feet. Inward of both there are protection works to guard against new channels forming through the beaches, which originally were little above high water spring tides.

During the past season the sum of \$995.61 was spent in the construction of a cribwork block 120 feet long, averaging about 15 feet wide and about 10 feet high, a little north of the northern breakwater, from about low water mark, inward to some distance within range of high water spring tides. This work is to prevent sand and gravel being carried into the channel, over the breakwater, as usually happened during northerly storms in the fall; the work is said to have proved effective during the past season; its height is about 4 feet above that of the breakwater. A portion of the run was also deepened by the use of a mud digger, worked from a float, the length of cut made being 150 feet, with a depth of 5 feet, at low water.

The amount expended on dredging is \$442.93 making the total expenditure for the last fiscal year, \$1,438.54.

#### MINK RIVER.

Mink River pier, King's county, also known as 'Murray Harbour North,' is situated on the north-east side and near the mouth of Mink river, where it enters the southern side of Murray harbour.

The pier is 400 feet long, consisting of a shore approach or abutment of 200 feet; 'blocks' and 'spans' for 130 feet, 20 feet wide, and a pier-head 70 feet long and 32 feet wide, all constructed of squared timber and built close-faced.

The pier is one of the many works constructed originally by the local government and which was assumed by the Dominion in 1884. It being then an old struc-

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ture, and much out of repair, work was required at different times to keep it in passable condition.

During the past season the sum of \$300.61 was expended in renewing the floor stringering and covering of the outer block, and of the three adjoining 'spans'; putting in new mooring posts, making up roadway of the approach with broken stone and gravel, and placing the work for the time in good condition. At the end and sides of the pier-head there is a depth of 6 feet at low water or 12 feet at H.W.S. tides.

Tides rise 6 feet.

## McPHERSONS COVE.

McPhersons Cove, King's county, is situated on the south side of Grand river, near its mouth, immediately within what is known as 'Morrison's Beach,' which separates Grand river from Boughton bay. The beach, which has a length of nearly a mile, extends in a northerly direction to about opposite Annandale, where a ferry is maintained by the local government.

A small wharf built on the point of the beach, was formerly used by the residents of the northern side of the river and vicinity; produce had to be hauled over the beach with great difficulty, and of late the wharf being so badly out of repair that it became useless.

At the request of the residents of the district, the department has undertaken to provide shipping facilities at the cove; plan and specification were prepared for a wharf 700 feet long. Tenders were invited and the contract was awarded to Mr. Thomas Campbell, for the sum of \$8,999.

Work was commenced early last spring, and at end of fiscal year the contractor had almost completed the approach, which has a length of 300 feet.

Expenditure during 1904-05, \$2,645.58.

## NEW LONDON.

New London harbour, Queen's county, is on the northern coast of the island, about ten miles east of the entrance into Richmond bay, and nine miles west from Rustico harbour. Within its entrance which has a width of about 1,200 feet, the harbour is about three miles long, and nearly as wide, it receives the waters of the 'South-west,' the 'Stanley,' the 'French' and the 'Hope' rivers, all of which are navigable for at least short distances, and having at them wharfs or shipping places, from which export is made of large quantities of produce, the districts surrounding the harbour being well cultivated, and very productive, and as they are also thickly settled a large quantity of general merchandise, coal, lumber, &c., is imported by water.

New London district not having, as so many other portions of the island, convenient railway facilities, the harbour as well is largely used as a fishing station, and harbour of refuge for fishermen, for which it is most conveniently situated being near some of the best fishing grounds on the Gulf of St. Lawrence.

To improve the entrance which is obstructed by a shifting sand bar, works were begun by the department in 1878, and these now consist of breakwaters and beach protections on either side; that on the eastern side now having a length of 1,200 feet, while the western one is 460 feet long; their purpose is to confine the water by preserving and extending the sand beaches, and thus by the increased current cause scour and increase the depth of water over the bar, which result has been obtained to a most satisfactory extent, the depth of water being much improved, at such times as the works are in good condition.

Since its construction the western work has received no injury requiring repair or expenditure, the eastern one, however, being exposed to a very heavy sea, strong

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current and action of the ice, requires about yearly some expenditure for its maintenance.

During the year the sum of \$749 was expended in making up settlement in the ballasting in different parts of the work ; repairing the sheathing of the outer block ; rebuilding a length of 80 feet of its inner end, and strengthening the end of the western breakwater.

The sheer dam or 'jetty' on the western side of the entrance, commenced on 2nd June last, was completed on October 5, 1904. This work which was let under contract, May 3, 1904, is about 1,000 feet inwards or southwesterly from the western breakwater; its purpose is to improve the depth of water over the shoal, at the junction of the 'French' and 'Southwest' rivers currents, formed there, it is said, during ebb tides. The work has in all a length of 550 feet, extending to near the inner edge of the shoal. It is constructed, for its inner length of 300 feet, of round log open cribwork, 12 feet in width, solidly filled with ballast and fender piled on the sides at ten feet centres ; for the further distance of 200 feet the work is 17 feet wide, and constructed of brush, piles and stone, the outer 50 feet being of similar materials but 23 feet in width, all of the 250 feet being close piled on the sides, and having the top or deck planked over.

The total cost of the work is \$6,172.50, including \$272.50 for superintendence.

Total expenditure during 1904-05, \$5,461.25.

#### NORTH CARDIGAN.

North Cardigan pier, King's county, is situated on the north side of the Cardigan river, about 5 miles from Cardigan bridge, and is one of the Prince Edward Island piers which was assumed by the Dominion government in 1884.

The pier as constructed had a length of 381 feet ; consisting of shore abutment 100 feet long, and 7 'blocks,' with intervening 'spans,' from 23 to 25 feet wide, except the outer 'block,' or pier-head, which had a width of 32 feet.

Being a very old work when assumed by the Dominion government, it has since, from time to time, required extensive repairs; the greater portion of the original work was mostly rebuilt, in addition to which all of the 'spans' have been solidly filled in. However, this pier did not give sufficient accommodation for the shipping done at the place and an extension of 75 feet was commenced in the spring of 1904 ; the materials were procured during the previous winter, and the extension was mostly completed by June 30, 1904 (except some fender piling of creosoted timber.)

Work was completed on September 1 last, at a total cost of \$2,980.59. The extension is 32 feet wide, standing in a depth of 14 feet at low water, or of 19 feet at high water springs, which rise 5 feet. It is built of close laid trimmed poles up to height of about low water, above which it is of squared timber close faced, solidly filled with ballast, and having the roadway on top formed of broken stone and gravel.

Expenditure during last fiscal year, \$279.46.

#### PANMURE ISLAND.

Panmure Island, King's county, situated on the south side of Cardigan bay, about 4 miles distant from Georgetown, is about  $1\frac{1}{2}$  mile long by about three quarters of a mile wide, and is connected to the mainland by a sand beach about  $1\frac{1}{2}$  mile in length.

There being no shipping facilities on the island, all the surplus produce being hauled over the long sand beach to St. Mary's bay wharf, a distance of six miles, or loaded in small boats on the shore, thence unloaded into vessels anchored in the bay.

The sum of \$2,000 was voted by parliament for a wharf, 300 feet in length, giving about two feet at low water, or six feet at high water spring tides, which rise here 4 feet.

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Materials were got out last winter, and work commenced in May ; at end of fiscal year 200 feet of work was about completed.

The amount expended during last fiscal year was \$1,255.92.

## PORT SELKIRK.

Port Selkirk pier, Queen's county, is situated on the south side of Orwell river, near its entrance into Orwell bay, and is distant by water about twenty miles from Charlottetown.

The pier is in the form of a 'T' consisting of a pier-head, 250 feet long and 35 feet in width, fronting on the edge of the channel, and connected to the shore by an approach, 250 feet long and 23 feet wide. The whole pier-head and the outer part of the approach are composed of a series of 'blocks' and 'spans,' floor stringered and planked over.

During the past year the sum of \$698.70 has been expended in levelling up southern block and span of pier-head, fender piling face and sides of this block, putting in new floor stringers, and covering where required, also the constructing of a small warehouse 12 by 18 feet, for use of shippers.

## RUSTICO HARBOUR.

Rustico harbour, Queen's county, is situated on the north side of the island, about midway between East Point and North Cape, and is one of its most important fishing stations.

To improve its entrance, which is obstructed by shifting sand bar, the department, during 1881-82-83-84, constructed works on either side, for the purpose of confining the current at ebb tide, and thus by scour deepen the water. This result was to an extent obtained while the works continued in good order.

The breakwater on the northern side also protects the inner low beach, on which most of the fishing stages and fish houses are situated; originally it was 1,240 feet long (that on the south side being only 450 feet), but through the effect of storms, action of ice, and ravages of the 'teredo,' 120 feet of its outer end was, by 1884, completely carried away.

To prevent more of the work being damaged, extensive repairs were made under contract in 1895-96; a head block, 30 by 60 feet, was added to the outer end.

Repairs are usually required every year, last season the sum of \$497.35 was spent in replacing the timber and sheathing on the sloping face of the outer block; making up ballast where washout or settlement had occurred; and building a temporary beach protection on a length of 240 feet, where the inner end had been carried away by the storm and high tide of November 14. The sum of \$1,000 was expended on tug service and deepening the water over the bar, by the use of scrapers, worked during ebb tide. The total expenditure for this work, from July last to end of December is \$1,457.27.

During the last fall, plan and specification were prepared for the construction of a breakwater on the eastern side of the entrance, the one built in 1881-84, having been completely destroyed through storms and old age; tenders were received up to May 17 last for the construction of a work 750 feet in length; the contract was awarded to Mr. George Matheson, for the sum of \$13,275.

## SAVAGE HARBOUR.

Savage Harbour, King's county, situated on the north side of the island, about three miles west of entrance to St. Peter's bay, and about five miles north-east from Mount Stewart junction, on line of Prince Edward Island railway, which by rail is twenty-two miles from Charlottetown.

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The harbour while of considerable extent is in general shoal, and its entrance is obstructed by a shifting sand bar, usually carrying about 3 feet at low tide with rise of 3 feet at high water spring tides. The position of the channel is not permanent being changed by storms, and at times more than one channel is formed through the beach.

To prevent storm tides from breaking over the beach and carrying sand into the harbour, brush hurdles were built during the past winter along western side of beach, for a distance of 4,500 feet; it remains to be seen what benefit they will be in making up the beach, as no storm tides of any importance have occurred since their construction. The total amount expended up to June 30, was \$1,006.

## SOURIS HARBOUR.

Souris harbour, King's county, is situated on the south-eastern side of the island, about sixteen miles west from East Point, and is most important as a harbour of refuge and place of shipment, for both of which it has been rendered available by the breakwater built and maintained by the Dominion government.

The work, which was commenced in 1875, has now a length of 1,250 feet. It being of different widths, forms and construction, may best, for the purpose of description, be divided into three sections or portions, viz., inner section, 290 feet long and 30 feet wide, built of close-faced timber, plumb-faced on the sides, and having on the seaward side, a protecting stone slope; the work stands in an average depth of 7 feet of water at low tides; middle section, 530 feet long, averaging 65 feet wide, also of close-faced square timber, but on the seaward side having the upper 10 feet sloping 1 to 1, this section stands in an average depth of 17 feet at low water, and, during the past three seasons, has been having a stone protection slope formed on its seaward side; on the outer or third section, 390 feet long, 24 feet wide, and has on the seaward side a protection of stone, extending to within 3 feet of the top, and sloping 3 to 1, its end terminates with a block 40 x 80 feet, constructed of close-faced creosoted timber, standing in a depth of 23 feet of water at low spring tides.

During the fiscal year ended June 30, 1905, the work of protecting the middle section with a stone talus was continued, about 1,000 cubic yards of stone were deposited on its seaward face. Some repairs were also made to the flooring, stringers, &c., of the outer section.

The total expenditure for the last fiscal year is \$4,598.37.

## WEST POINT.

West Point, Prince county, is situated on the north side of Egmont bay, on the eastern shore of Northumberland strait, about fourteen miles from O'Leary station, on line of the Prince Edward Island railway, and about thirty-five miles by water from Summerside harbour.

A wharf was built at that place by the local government many years before confederation, to give some shipping facilities to the district, there being at the time no wharf or shipping place between Summerside and North Cape, where vessels of any size could call, a distance of about sixty miles. The wharf, which was assumed by the Dominion government in 1884, is said to have proved of much benefit up to that time, but then received serious damage on the breaking up of the ice, and remained in bad condition until 1898, when it was thoroughly repaired by the department. At that time wharf had a length of 620 feet, width of 30 feet, and extended out to a depth of 7 feet at low water, or of 11 feet at high water springs, which here rise 4 feet.

For the purpose of obtaining a better depth of water, an extension of 100 feet was built in 1901, reaching out to a depth of 9 feet at low water; but this has since shoaled to about 7 feet on the bar that has to be crossed for its approach, while

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settlement occurred in the outer part of the new work. The work of levelling up was commenced in the spring of 1904, and was completed by the end of July last, at a cost of \$491.55. The total for levelling and close-piling of the 100 feet extension is \$1,931.30.

## WOOD ISLANDS.

Wood Islands, Queen's county, are situated about thirty miles south-east of Charlottetown, and fifteen miles to the westward of Cape Bear, and are the most southerly portion of Prince Edward Island. Originally two small islands, they are now connected together, as also to the shore by sand beaches; a sand spit extends out from the shore to within 300 feet of what had been the eastern island.

The formation of a shipping place was commenced here in 1859, by the provincial government, but as at no time were the works in good condition, little, if any good resulted from them until in 1894, when reconstruction of the northern breakwater was effected by the department, and the southern one repaired. This latter work has since been extended, having now a length of 950 feet. The northern breakwater is 2,500 feet long.

After the extension of the southern breakwater, the increased scour being in danger of undermining it, close piling was put in different parts of the seaward face, as well as brush mattresses filled with stone.

During the past fall the sum of \$249.93 was so expended on a length of 200 feet of the inner part of the breakwater to protect it against scour.

## NEW BRUNSWICK.

## ANDERSON'S HOLLOW.

Anderson's Hollow, is a cove of Salisbury bay, on the northern side of Chignecto channel, in the Bay of Fundy.

Spring tides rise  $40\frac{1}{2}$  feet; neaps,  $32\frac{1}{2}$  feet.

The breakwater wharf at this place was begun in 1879, by the construction of a detached block 550 feet from the shore, with which it was afterwards connected. In August 1885, the work was 290 feet in length, and three years later was carried to the shore. The structure, 25 feet wide on top, was originally 27 feet high at the outer end, but the bottom having been raised by the accumulation of the littoral drift, the height is now 3 or 4 feet less. It is built of round crib-work, lightly battered on the inside, but sloped at the rate of  $\frac{1}{2}$  to 1 and sheathed on the weather face.

The breakwater was damaged by storm on November 21, 1895, when a small light-house, placed on the outer end, was swept away, together with part of the break, while some of the top work at the head was simultaneously shaken and started.

In 1895-96, a small sum was applied to bolting loosened timbers for temporary security.

During the fiscal year 1896-97, the inside face of the wharf at the outer end, which had received a heavy list in the storm of the previous year, was taken down and rebuilt for a distance of 75 feet on top and 44 feet on the bottom.

The list was taken out, the new face being carried to a height of 15 feet in order to level the top, and new covering was laid for a length of 75 feet. Seventy feet out of 110 feet of dismantled break were reconstructed, and fenders were placed on the inside of the new face.

In 1898-99, by an expenditure of \$121.31, twenty-seven pieces of new sheathing were laid and bolted to the sloping face; a new cap and face-timbers were inserted, and the gap in the break, 40 feet long, left unfinished at the time of the previous repairs, was built up with four tiers of timber, strengthened with knees.



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In 1900-01 the break-timbers, which had been started up from 3 to 9 inches by storms for a distance of 290 feet, were restored to position. For 25 feet at the outer end, the break was raised one tier; 8 bridles, 9 inches square, were placed between the knees of the break for a distance of 100 lineal feet, 3 new pieces of 6-inch sheathing were placed in the sloping face, and loose planks were secured with bolts. Through the shoal obstructing the work on the inside, a channel 300 feet long, 35 feet wide and 5 feet deep was made by means of a wheel scraper. It was found, however, that the shoal formed again rapidly with the recurrence of any south-west swell. A groyne, 50 feet in length, made of piling and 9 inch timber, was built on the outside of the work, in order to check for a time the accumulation of littoral drift on the inside.

During the year 1901-02, new sheathing, 6 inches thick and from 22 to 26 feet long, was laid and secured with  $\frac{3}{4}$ -inch bolts at different places along the weather face of the outermost 190 feet. Additional bolts were also driven to secure the old and loosened sheathing; while 71 pieces of new covering, 6 inches thick, were placed on the top of the work.

During the year 1902-03 the weather-face of the outer block, 100 feet long, having become decayed was cut down nearly to the bottom and rebuilt for a width of 13 feet with heavy timbers, secured in great measure with screw bolts, the outside being sheathed with 9-inch spruce. More than half the covering of this block was renewed and a new break was built 3 tiers in height for 26 feet, 2 for 61 feet and one tier for 13 feet in length. The covering was patched on other parts of the work. Four new fenders were placed, and the cap was renewed for a length of 47 feet. An extension of 50 feet for which foundations were excavated through the shoals to the rock, was begun and brought up to a height of four tiers.

During the fiscal year of 1903-04, the break on the outer block was completed and the sheathing was fully bolted. An extension, 50 feet long, and 27 feet wide on top, was begun and brought up to within 2 tiers of the finished top. The sheathing, fenders and covering yet require to be applied to complete this extension. The shoal was excavated sufficiently to make beds for the shipping.

In 1904-05 the extension was completed, sheathed, covered, ballasted and fendered; one new ladder was made and placed in position; a quantity of sheathing was re-bolted; five new fenders were placed; 700 lineal feet of pieces of covering were laid; 35 feet of new fenders were placed, and one new mooring post was put in, and the break for 72 lineal feet was rebuilt. The steep approach to the wharf was besides improved by lowering the rock-cutting 4 feet, by widening it to 14 feet and by making an embankment 21 feet wide, supported on both sides by retaining walls of stone, each 33 feet long, 9 feet in mean height, and  $2\frac{1}{2}$  feet in mean thickness, containing 55 cubic yards of dry masonry.

Like many other works in the Bay of Fundy, Anderson's Hollow crosses the direction of the flood stream and of the prevailing winds; in consequence, an accumulation of littoral drift is found on the south-west side, which travels around the end, and is deposited under the lee of the breakwater, forming a shoal, which is an obstacle to vessels.

The expenditure during the fiscal year 1904-05, was \$1,597.90.

The total expenditure to June 30, 1905, is \$37,964.32.

#### BATHURST.

Bathurst, the shire town of Gloucester county, is situated at the head of Nepisiquit bay. It is a station on the Intercolonial railway, distant one hundred and twenty-two miles north of Moncton, and the western terminus of the Caraquet railway.

During 1901-02, the provincial government wharf, on the lower side of the bridge between Bathurst and Bathurst village, was transferred to the department.

The work of repairing and partly reconstructing this wharf was begun in the spring and finished in the autumn of 1902. As completed the wharf is 174 feet long and 35 feet wide on top.



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In October, 1904, four piles which had started out from the wharf, about 1 to 3 feet, and on which vessels were liable to catch and sustain damage, were cut off at the level of the bottom, i.e. about 6 feet below low water, at a cost of \$25.

The total expenditure up to June 30, 1905, is \$3,090.31.

## BELLIVEAU.

Belliveau is a farming settlement on the eastern side of the Petitcodiac river, fourteen miles below Moncton, and nearly opposite Hillsborough in Albert county.

The department constructed a wharf here in 1888, of round cribwork, 233 feet long, 24 feet wide on top and 23 feet high at the outer end, to replace a work destroyed in 1869, and to afford facilities for shipping lumber and produce and for landing supplies.

Since its construction no expenditure has been made on the work, but lately the top has been so much out of repair as to render the wharf unfit for use.

In 1903-04, repairs were commenced. The decayed timbers of the top were removed and new cross-ties and face timbers and an extra top face timber placed. The interior, for a length of 135 feet from the outer end, was filled with  $3\frac{1}{2}$  feet of brush covered for a length of 19 feet with about 9 inches of stone. One hundred and twenty cubic yards of stone were procured towards completing the repairs.

In September and October, 1904, the brush and stone filling was completed, and one foot of marsh mud and gravel was placed over the top. A new ladder was built and six ring bolts placed. The filling having settled during the winter, 7 inches of additional gravel was placed over the wharf in June, 1905, and two broken ring bolts were renewed. A bed for vessels was also constructed 76 feet long and 20 feet wide, along the lower side. The outer 10 feet of the bed was built of cribwork three tiers high. The inner 66 feet was formed by excavating the mud to an average depth of 3 feet.

The expenditure for the fiscal year 1904-05, was \$298.93.

The total expenditure to June 30, 1905, was \$3,649.20.

## BLACK RIVER.

At Black River, a small cove on the Bay of Fundy, twelve miles east of St. John, where spring tides rise about 25 feet, a breakwater or wharf of square cribwork, 155 feet long, 27 feet wide, and 30 feet in extreme height, was built by the department in 1879, for the use of coasting vessels.

Between 1891 and 1893, the work received small repairs, and the total expenditure up to June 30, 1898, amounted to \$4,407.92, \$3,907.40 of which may be charged to construction, and improvements, and \$500.52 to repairs.

During the year 1898-99, a sum of \$450 was expended in replacing thirty-six fenders, in taking up and re-laying the covering, in building ladders, &c.

For some years no shipments were made at Black River; of late, lumber cut by portable mills in the neighbourhood has been loaded at this wharf.

Heavy rains in the summer of 1904 scoured the road and washed down quantities of sand and stone on the top of the wharf, completely covering it to a depth of six inches at the outer end, and three feet at the inner end. In 1904-05, this was cleared off, and the approach was pulled down and rebuilt for a height of thirteen tiers.

The expenditure during the fiscal year 1904-05, was \$303.79.

The total expenditure to June 30, 1905, is \$5,161.71.

## BUCTOUCHE.

Bouctouche, with a population of between 600 and 1,000, is situated four miles above the mouth of the Buctouche river, which empties into Northumberland straits, twenty-two miles south of Richibucto and seventeen miles north of Shediac.

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In 1884-86 the department constructed a wharf here of round timber, fendered with piles about 300 feet long and 40 feet wide, with a depth of 17 feet at low water or 21 feet at high water spring tides at the face. The work is parallel to the shore and immediately below the road bridge spanning the Buctouche river. A siding of the Moncton and Buctouche railway runs close to the back of the wharf throughout its length.

In 1894 the wharf was badly damaged by fire. During the following year it was partly repaired.

Between 1899 and 1901, thorough repairs were made to the upper 162 feet section of the wharf. Instead, however, of rebuilding of cribwork, pilework was substituted in order to keep the weight of the superstructure off the worm-eaten timbers below and thus avoid crushing.

In 1903-04, the remaining part was repaired in the same way. The inner 15 feet of the whole wharf was filled with brush, stone and earth and graded approach made to the road bridge. The approach to the street was also repaired for a length of 128 feet with new covering and caps.

In October, 1904, the work was levelled where the grading had settled, by the addition of earth and stone.

In the spring of 1905, a fire which burnt several houses in Buctouche also destroyed a considerable part of the approach from the street. The repairs rendered necessary consisted of rebuilding three out of the four cribs supporting the roadway, laying 87 feet of new 4-inch covering 17 feet wide, and 170 feet of cap, besides stringers and corbels.

A quantity of 6-inch creosoted plank was obtained for close piling the face of the wharf.

The expenditure for the fiscal year 1904-05 was \$1,885.17.

#### BUCTOUCHE HARBOUR.

Buctouche Harbour is separated from Northumberland straits by a sand beach from six to seven miles long. At the southern end of the beach is the entrance to the harbour. The northern end, off which are important fishing grounds, is connected with the mainland.

The inhabitants of the northern end of the harbour are practically debarred from outside fishing by the distance from the village around by the harbour entrance to the fishing grounds, and the boats on the outside shore have now no shelter during storms and are frequently wrecked. It is therefore proposed to make a cut through the beach at its northern end, its narrowest point, the width there being only about 500 feet. Breakwaters will be built on the seaward side to maintain the cut, and stake and brush fences along the low points of the beach, to cause an accumulation of sand.

During 1904-05, a fence of breastwork was built northward from the proposed cut for a length of 1,585 feet. This fence is composed of pickets, 7 to 8 feet long driven in two rows, 1 foot apart each way. Brush was placed transversely below and longitudinally above, between the pickets, pressed down and secured by narrow boards nailed across the tops of the pickets. Materials for the breakwaters and for a continuation of the fence were also obtained.

The expenditure for the fiscal year 1904-05 was \$2,027.17.

#### BURNT CHURCH.

Burnt Church is a farming, fishing and lumbering settlement, on the north shore of Miramichi bay, 22 miles north-east of Chatham. The Miramichi Steam Navigation Company's boat calls twice daily during the season, and the place is much used as a summer resort.

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During 1899-1900, a contract was let for the construction of a wharf 1,180 feet long, composed of a shore block 200 feet long and 20 feet wide; 23 blocks, 21 feet long and 20 feet wide, placed 20 feet apart, and a pierhead 60 feet long by 40 feet wide. The whole was constructed of round timber in open cribwork, topped with 12 x 12 inch stringers and 4-inch plank. The work was completed on September 15, 1901.

During 1903-04, complaints having been made that a dangerous rock lay in the path of steamers approaching the wharf, an examination was made and a boulder found weighing about 10 tons, lying 300 feet above the wharf and 50 feet outside the range of the pierhead. A blade broken from a steamer's propeller was found beside it. With the aid of a diver, the boulder was blasted and removed. Thirteen fenders were placed on the outside face and corners of the pierhead, to prevent damage to the steamer through catching on the face or on the iron straps at the corners. The outermost span of the wharf was also closed to give security to boats lying inside the pierhead, by placing 3 longitudinals one above the other between the blocks and spiking 3-inch hardwood plank close laid vertically to each side.

During 1904-05 the batter at the ends of the pierhead was reduced from 1 in 2 to about 1 in 5, to make the ends as well as the front available as berths for vessels. By means of longitudinals and uprights the top of the work was built out. Eleven hardwood fenders were then placed, 5 feet 6 inches centre to centre, at each end, and between them the work was sheathed with 3-inch hardwood plank. Gangways were also cut out of the cap timbers at both ends, and the slope of the slip, in the front face, was reduced. The second span from the outer end was closed similarly to the span closed in 1903-04, and 4 uprights were added at each span, to hold the longitudinal timbers in place. The cap timbers and fenders throughout the wharf were coated with carbolineum.

The expenditure for the fiscal year 1904-05, was \$600.02.

The total expenditure to June 30, 1905, was \$15,309.92.

## CAMPBELLTON.

Campbellton, an incorporated town of about 3,000 inhabitants, is situated on the southern side of the Restigouche river, 14 miles above Dalhousie and 6 miles below the head of the tide. It is a station on the Intercolonial railway and an important deal port from which, during the calendar year 1904, were shipped 22,172,000 F.B.M. of deals, 7,892 M. of laths and 24,781 M. of shingles.

For the reception of the ballast of vessels engaged in the deal trade, the department in 1889, constructed a block, 140 feet long and 34½ feet wide on top, of close faced cribwork, 108 feet below what was then known as the Ferguson wharf. It was afterwards covered for use as a wharf and in 1892, another block of similar construction and width was built to close the opening between the two works, giving a total frontage to the departmental wharf of 250 feet, with a depth of 11 to 20 feet at the outer face. After the construction of the second block, the Ferguson wharf was sold to J. P. Mowat, and subsequently by him to Kilgour Shives.

As access could only be had to the departmental work by traversing the Shives' wharf, steps were taken in 1901, to acquire the latter, and as it was in need of repairs, materials were procured at a cost of \$2,224.32 during the same year, to effect such necessary repairs, but the work was not commenced as the property had not been purchased.

During the fiscal year 1902-03, the Shives wharf became vested in the Crown. The sum of \$226.50 was expended during that year in caring for and looking after the timber procured for repairs.

During 1903-04, the repairs of the Shives' wharf were begun on the outside face 90 feet long, and for a length of 46 feet on the upper or western face. The old work was torn down to near low water level, and 23 sets of walings were bolted to main piles, on the face and to posts inside set on sills, placed on the old work. A ballast

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floor was laid on the lower walings and covered with 8 feet of ballast. The whole was covered with 6-inch plank 18 feet wide on the front face and 15 feet wide on the upper face, and close piling was driven between the main piles. The inner portion of the wharf was graded level with the flooring with stones and earth. A new pile driver was also built.

In 1904-05, these repairs were completed, the work done consisting of driving 18 close piles, bolting 79, and trimming 90; placing 40 short pieces between the piles, above the tops of the walings, and two mooring posts. A small amount of earth was also placed on the inner portion of the wharf to complete the grading. Material costing \$783.55 was obtained for continuing the repairs of the western face in to the shore.

On October 11, 1904, a contract was entered into for the construction of a deep water extension to the present government wharf, 304 feet long by 35 feet wide, connected with the old work by a span 15 feet wide on the centre line, which will increase the frontage of the government wharfs a total distance of about 322 feet. The work is to be built on a foundation dredged to 22 feet at low water. The contract price is \$35,300.

Construction was begun on June 12, 1905, and by June 30, one crib, 140½ x 41 feet at bottom, had been built to a height of 12 feet 3 inches.

The expenditure for the year amounted to \$42,353.86.

#### FERRY LANDING—CAMPBELLTON.

Between 1889 and 1891, the department constructed a ferry wharf about 400 feet above the Shives' wharf. On account of the strong currents there and its outer end being dry at low water, this wharf was but little used and is now very much out of repair.

The ferry boat has since been using a private dock and slip, opposite the central part of the town. In 1903-04, the slip and sufficient wharf frontage also a right of way to it, were acquired by the department.

In 1904-05, a new slip 35½ by 60 feet was built of cribwork filled with ballast and covered with 4-inch plank, to replace the old slip which was out of repair and did not extend into deep enough water. The roadway approach to the slip was also widened to 35 feet, involving an excavation, chiefly of rock, about 190 feet long, 12 feet wide and 4 feet deep. A small pile protection work was also built at the upper corner and seven fenders bolted to the lower corner of the dock, for the protection of the ferry boat when entering.

The expenditure for the fiscal year 1904-05, was \$573.93.

#### CAPE TORMENTINE.

Cape Tormentine is situated on the south-western side of Northumberland straits at the extreme eastern end of Westmoreland county. It is the terminus of the New Brunswick and Prince Edward Island railway, and the nearest point of communication between Prince Edward Island and the mainland, the distance being nine miles.

To form an artificial harbour for purposes of interprovincial communication between the island and the mainland during the winter, a breakwater pier was constructed by the department between 1886 and 1892.

The structure comprises a straight pier, or approach, 2,500 feet long, the first 1,300 feet of which is a rubble mound 20 feet wide on top with slopes of 2 to 1, and the remainder close-faced cribwork 30 feet wide on top and a pierhead and return of close-faced cribwork, each 400 feet long and 40 feet wide from the base up to a little above low water, then decreasing to 30 feet at the top which was originally 4 feet above high water spring tides. Between low water and the top of the work, the head and return presented a sloping face to the east and south sheathed with hardwood. The whole incloses a basin or harbour of about four acres in area with depth, up to

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the autumn of 1892, of 13 to 15 feet at low water, but increased since then, by dredging over parts, to a depth of 18 feet.

Spring tides rise  $7\frac{1}{4}$  feet and neaps,  $3\frac{1}{4}$  feet.

Owing to the ravages of the teredo, repairs became necessary to the timber section of the work soon after its completion and have since been carried on annually. They have consisted mainly of renewing the face timbers and sheathing of the sloping faces of the pierhead and return, protecting the north and portion of the south faces of the approach and about 300 feet of the outer face of the head with large and small stone, and driving close-piling along a portion of the south side of the approach.

During 1901-02, a temporary quay face 205 feet long was constructed of piles driven 4 feet centre to centre and hardwood walings and cross-ties, along the outer or south face of the 'return' for the steamer *Stanley* plying between Cape Tormentine and Prince Edward Island during the winter. A combined station and freight shed, 100 by 25 feet, was also built on the 'return'; 436 creosoted piles were driven generally  $2\frac{1}{2}$  feet apart, along the harbour sides of the pier and 24 feet to protect the new quay face.

In 1902-03, the remains of the old slope, at the south-east corner of the pierhead, were replaced by a structure composed of double close-piling, seventy-three piles in all, and walings, filled with stone, covered with  $4\frac{1}{2}$ -inch plank and secured outside with four iron straps. The work of raising and levelling the top of the timber portion of the breakwater, which had settled considerably, was also begun; new face timbers, cross-ties and stringers being added for 750 feet of the approach to bring the top of the flooring 4 feet above H.W.O.S.T. The timbers were treated with carbolineum.

During 1903-04, this work was continued throughout the approach and for part of the pier head in a similar manner except, on the pierhead piles were driven 5 feet centre to centre, inside the sloping face and screw bolted to face timbers and cross ties. On a section of the pierhead 49 feet long, next the corner rebuilt in 1902-03, the old timbers were removed nearly to low water level on the outside, and the work was built with a vertical face, consisting of a row of piles 5 feet centre to centre to which were bolted four walings and three sets of cross-ties, tied into the old work, protected by forty-two creosoted piles driven close, and fully ballasted and covered with 5-inch plank. The top was levelled at 4 feet above H.W.O.S.T. Ten hardwood piles were also driven between the corner and the creosoted close piling. A movable platform, 7 by 70 feet, was built on the pierhead for the winter service and taken down in the spring. Slight repairs were made on the freight shed and return.

During the fiscal year 1904-05, the 49-foot section of vertical face on the pierhead was completed, a cap-timber and mooring post being placed, the creosoted close-piling trimmed off and bolted to the cap, and continued northerly 45 feet. The new section was completed except for close-piling, ballast and covering. On the return, where the old slope was partly carried away, the work being eaten away and undermined by the teredo, a length of 50 feet, at the south-west end, was rebuilt in the same way and completed, except for close-piling, ballast and covering. A further length of 50 feet of the same work was begun, for which the main piles (10) were driven and two walings and one tier each of cross ties and longitudinal placed. Sixty-three of the quay face was rebuilt permanently, being faced with creosoted close piling and filled with ballast. Along the remainder of the quay face 58 feet of new bridles were placed between the old fender piles. The levelling of the pierhead was completed over the remaining length of 250 feet, of which 60 feet required only laying the covering over the work levelled in 1903-04. Two new mooring posts were placed. A steel plate, 12 feet long and 26 inches wide, was bolted around the north corner of the pierhead, and eleven hardwood fenders were placed on the approach near the same corner, to protect the raised work. Five hundred and eighty-eight cubic yards of large stone were procured for the stone slope, along the north side of the approach, and  $2,306\frac{1}{2}$  cubic yards of small stone, which was partly mixed into the large stone and partly placed inside the work. A temporary freight plat-

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form, 85 x 8½ feet, was built for the winter traffic and removed in the spring, and a board track laid, 67 x 8½ feet, between the slip on the quay face and the freight shed. Slight damages to the freight shed caused by a storm were repaired. Eighty-two thousand seven hundred and sixteen F.B.M. of 12 x 12 creosoted close-piling were procured.

The expenditure for the fiscal year 1904-05 amounted to \$19,998.34.

The total expenditure to June 30, 1905 is \$333,298.61.

#### CARAQUET.

Caraquet, Gloucester county, a thriving fishing village, is situated on the southern side of Bay Chaleur, forty-two miles east of Bathurst and twenty miles northwest of Shippegan, the eastern and western termini of the Caraquet railway, on which, with the exception of Bathurst, Caraquet is the most important station.

For the purpose of establishing a deep water terminus for the shipment of lumber from Gloucester county, a contract was entered into in March, 1902, for the construction of a wharf at Caraquet, 1,700 feet long, with a depth along the outer 300 feet of 22 feet at low water. Spring tides rise 6 feet.

The work is to consist of an approach or shore block 255 feet long and 25 feet wide on top, 25 blocks 25 feet square, 26 spans of 20 feet and pier-head, 300 feet long and 40 feet wide. It is to be constructed of round timber, open cribwork filled with ballast, the openings to be spanned by double 12 x 12-inch timbers and the whole finished with 4-inch covering and 10 x 12 caps. The contract price was \$59,990.

The work of construction was commenced on July 7, 1902, and at the close of the fiscal year 1902-03, had progressed as follows:—The cribwork of the approach and blocks Nos. 1 to 5, inclusive, were completed, ready to receive the corbels and stringers; block No. 6 was constructed to within one tier of cross-ties of the required height, and blocks Nos. 7, 8 and 9 were built eight tiers high and placed in position.

At the close of the fiscal year 1903-04, the cribwork of the approach and first ten blocks was completed ready to receive corbels and stringers; the cribwork of block 11 was built to within three tiers of the top; of blocks 12 to 19 to full height; of blocks 20 to 23 to about 2 feet above low water level, and of block 24, nine tiers high.

A section of the pier head, 50 feet long, was built nineteen tiers high and a section, 100 feet long, to a height of four tiers.

At the close of the fiscal year 1904-05, the cribwork of the approach, blocks (25) and a 100 foot section of the pierhead had been built to full height. The cribwork of the pierhead sloped downwards in the next 126 feet to about 4 feet above low water. The last section 74 feet long, had been sunk in place and half filled with stone. Fenders were placed complete on the approach, first sixteen blocks, and first 50 feet of the pierhead, corbels, stringers and covering were laid, from the shore block to the end of the eighteenth block, and outside stringers on the shore block; corbels were also placed on blocks twenty to twenty-five, stringers on blocks twenty-one and twenty-two, and stringers and covering from block 23 out to 50 feet beyond the inner end of the pierhead; the first 60 feet of the pierhead was sheathed with hardwood down to 2 feet below low water level.

The expenditure for 1904-05 was \$31,539.

Total expenditure to June 30, 1905 is \$49,224.25.

#### CHANCE HARBOUR.

Chance harbour is a cove situated on the Bay of Fundy, eighteen miles west of St. John.

The timber required to construct a small breakwater at this place was delivered in the spring, and the work was begun. By the end of the fiscal year, the outer end



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had been built to a height of nine tiers, and ballasted, the bottom tier is 80 feet in length.

The expenditure to June 30, 1905, is \$2,875.54.

## CHOCKFISH RIVER.

Chockfish river empties into Northumberland straits, about midway between the entrance to Richibucto and Buctouche harbours.

A sand beach extending from the north had rendered the entrance to the river circuitous and shallow. To produce a straight and deeper channel and a safer entrance for fishing boats, the construction of a dam was begun in the autumn of 1901, to close the deflected channel 400 feet south of the original river mouth. It was built from the mainland a distance of 130 feet, the channel shifting outwards around its end at the same time. The dam consists of a rubble mound 7 feet wide on top laid on brush mattresses, through which were driven two rows, 7 feet apart, of piles spaced 5 feet centre to centre longitudinally.

In 1902-03, construction was commenced on the sand beach and continued shorewards to meet the old work, and an extension  $27\frac{1}{2}$  feet long, of lighter construction, was built at the inner end of the latter, giving the dam a total length of  $356\frac{1}{2}$  feet. At the same time a trench was cut through the beach, about 300 feet north of the dam, which, under the influence of spring freshets, enlarged to a channel about 70 feet wide with 8 to 9 feet of water at spring high tide, making a considerable improvement over the old channel.

Owing, however, to the heavy sand drift from the north, the channel soon began to move southward. Therefore during 1903-04, a breakwater was built running southeasterly along its northern side. The breakwater consists of an inner length of 48 feet, formed of posts and cross-ties (eight bents) to carry a light tramway, with brush and stone between to catch the drifting sand. A length of 348 feet constructed of two rows of piles, 6 feet apart centre to centre, each way, connected by cross-ties, one to each bent, and two walings, filled between with brush and stone, and with a slope of the same on the seaward side; and an outer section, 120 feet long, constructed of three rows of piles, the outer driven close and the two inner, 6 feet apart longitudinally, with cross ties, one to each bent, and four walings. The width, over all, of this part is 11 feet 6 inches. The interior was filled with brush and stone with the exception of twelve bays which still required an additional foot of stone.

During the fiscal year 1904-05, a second breakwater 132 feet long was built on the south side, extending from the dam towards the outer end of the north breakwater. It is similar in construction to the outer 120 feet of the latter, except that four fascines were laid under the loose brush throughout its length. Timber 10 x 12 was used for the cross-ties and 10 x 10 for the four walings. A trench was also cut through the bar which had formed about the end of the north breakwater.

The expenditure for the fiscal year 1904-05, was \$1,189.50.

The total expenditure to June 30, 1905, is \$5,954.39.

## DALHOUSIE.

Dalhousie, Restigouche county, is situated on the Restigouche river, 14 miles below Campbellton. It has a population of over 800 and is an important deal port. The harbour of Dalhousie, one of the best in the province, being well sheltered and having a depth of from 4 to 7 fathoms at low water.

At the terminus of a branch of the Intercolonial railway, the department constructed in 1887 a wharf 300 feet long, 22 feet wide on top and giving a depth of 14 feet at low water. This depth has since been reduced through ballast having been washed out of the work.

On August 1, 1904, a contract was entered into for the construction of a deep water wharf, immediately above the present government wharf. It is to be 304 feet



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long and 35 feet wide, built on a foundation dredged to 24 feet at low water. The contract price is \$42,000.

Expenditure during last fiscal year, \$30.42.

## DIPPER HARBOUR.

Dipper Harbour is a post settlement on the Bay of Fundy, St. John county, 20 miles from the city of St. John.

During the fiscal year a contract was let for the construction of a new breakwater, the work to be 335 feet in length and 43 feet high at the outer end, intended to replace an old breakwater, and to give shelter to fishing boats in the neighbourhood.

The expenditure during the fiscal year 1904-05, was \$4,639.65.

## DURHAM.

Durham, the most easterly parish of Restigouche county, has a population of 2,200, occupied in lumbering, farming and fishing.

To afford protection for the fishing boats, for which there is now no shelter between Petit Rocher, 15 miles to the east, and Heron Island, 10 miles to the west, and to facilitate the shipment of lumber, of which 3,000,000 feet B.M. are cut annually, a contract was entered into on June 20, 1905, for the construction of a breakwater at a point near the easterly end of the parish.

The proposed work will consist of an approach, 670 feet long and 20 feet wide on top, and a pierhead or 'L' 50 x 30 feet, measured on the top, the whole to be built of round timber sheathed, with the exception of the inner 70 feet, with hardwood plank.

The contract price is \$17,700.

The expenditure during the last fiscal year amounted to \$146.85.

## EDGETT'S LANDING.

Edgett's Landing, in Albert county, is on the west side of the Petitcodiac river, two miles below the village of Hillsborough.

To replace an old provincial government work, destroyed by the Saxby gale in 1869, the construction of a wharf was begun twenty years later by the department, and was finally completed in the fiscal year ended June 1893. The wharf is 400 feet long, composed of an earthen approach 20 feet wide, and 50 feet in length; round cribwork 250 feet and square cribwork 100 feet long. The head is 40 feet wide, 35 feet high and stands in 30 feet at high water; it is dry at low water.

Spring tides rise 46 feet.

Renewal of the covering, which had become decayed, and levelling up of the stringers, which had settled, was begun in May, 1900, and completed in 1900-01.

In 1904-05, the upper works having become decayed, the outer block, 100 feet long, and 40 feet wide, was pulled down and rebuilt for three tiers in height; while the next stretch of 100 feet was also pulled down and rebuilt, excepting the top cross-ties, for the same height.

The expenditure in 1904-05, was \$3,000.

The total expenditure to June 30, 1905, \$13,340.75.

## FORT DUFFERIN.

Fort Dufferin, built by the Imperial government to command the western entrance to St. John harbour, stands on high ground, immediately above the end of Negropoint breakwater.

In order to preserve from erosion by the waves, the headland crowned by the battery, this department began in 1882, at tide-level a retaining wall of sheathed

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cribwork, 430 feet in length, and in the following year constructed a further length of 303 feet. The work is exposed on the one hand to the force of the waves, and on the other hand to land slips.

In 1886-87, it was much disturbed by the sea and repairs were made in that and the following years, 205 feet of the original work being rebuilt. From 1887 to 1889 repairs were also made, and in 1890 the work was extended 100 feet.

General repairs were made in 1893-94. The work is from 7 to 14 feet wide on top, and about 9 feet in mean height. The crest for the whole length is surmounted by a break  $2\frac{1}{2}$  feet high.

During the year 1896-97, a gap 81 feet long in the break was repaired, 200 lineal feet of longitudinals were renewed inside, and 128 cubic yards of ballast were restored to the work; while the sheathing was patched at intervals along the face with hardwood planking. In order to raise the beach, and so protect the lower part of the face, toward the end of 1896, a groyne 40 feet long, 10 feet wide and 4 feet in average height, was built of hardwood piles, timber and stone. In 1897, extension of the cribwork a distance of 130 feet was begun, and by the end of that fiscal year had been brought within two tiers of the full height.

In 1897-98 the new extension was completed, ballasted and sheathed. Small repairs were also made to the sheathing of the old work.

In 1898-99 four groynes, in all 332 lineal feet, each built of hardwood piles, spaced 4 feet apart, driven from 9 to 12 feet into the bottom and planked with birch 9 inches square, securely strapped and bolted, were placed along the beach to protect the lower part of the sheathing of the breast-work; some ballast was also placed in the cribwork.

Ordinary repairs, comprising restoration of a breach in the face, ballasting and renewal of the sheathing, were made during the year 1899-1900.

In 1900-01, the face was sheathed for 145 lineal feet; ten piles were driven to restore, with the addition of cribwork, a breach 11 feet long; 62 lineal feet of large hemlock face-timbers were inserted; some loose piles were rebolted, and 373 cubic yards of ballast were placed in the work. At the upper end, the breast-work was repaired for a distance of 235 feet by placing a new tier of 12-inch cross-ties, 395 lineal feet of face-timbers, and by the insertion of 24 knees, with as many chocks, secured by screw-bolts.

In 1901-02, one hundred and thirty-six spruce piles, 26 feet long, were driven from 6 to 8 feet into the bottom for a distance of 108 feet along the face of the breastwork. In another place, for a total length of 126 feet the face was sheathed with 6-inch spruce, and the old sheathing was patched at intervals for a distance of 210 feet. A break 3 feet in height was also constructed of four tiers of spruce timber, supported at intervals of 10 feet by 21 framed braces, made of 8 x 8 spruce. Some brush was deposited at the back of the innermost block of cribwork, and beneath the adjacent groyne for the purpose of assisting the accumulation of silt and drift.

In 1902-03, the face of the breastwork was protected with close-piling for a length of about 178 feet, fourteen pieces of spruce sheathing were applied to the work and about 400 cubic yards of ballast were placed. An extension of the protection was made for a distance of 94 feet by driving close-piling, secured with double walings and stiffened by bracing fastened to piles driven 13 feet in the rear. The inside of this work was partially filled with brush and stone.

During the fiscal year 1903-04, a new block, 70 feet long and 20 feet wide of close-faced cribwork, was built at the inner end of the breastwork. The cap of this block is flush with the break of the old work.

In 1904-05 one of the angles of the work was sheathed with 6-inch plank; the braces and upper timbers, for a distance of 160 feet were painted with carbolineum avenarius; 450 cubic yards of stone ballast were placed in the work.

The expenditure during the fiscal year 1904-05 was \$974.95.

The total expenditure to June 30, 1905 is \$31,146.25.

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## FOX CREEK.

Fox Creek, Westmoreland county, is a village and farming settlement on the Petitcodiac river, three miles below Moncton. It has a population of about 350.

In 1880, the inhabitants assisted, to the extent of \$850 by the provincial government, built a wharf 177 feet long and 40·3 feet wide, at a total cost of about \$1,800. It was, however, built too long, projecting within reach of the rough waters of the tidal bore, which has made it impossible for vessels to lie there. To remedy this, and also to make good the whole top which had become decayed, repairs were begun in September, 1904.

The decayed timbers throughout were removed and a length of 35 feet was cut off the outer end to a depth of 20 feet. The next 40 feet were then rebuilt on top, with cribwork, to form a pierhead about 40 feet square. In the next 22 feet the cribwork was built up but decreasing in width to 16½ feet, which width was held for a further 7·7 feet. Three-inch covering was laid over all, seven mooring posts were placed in the work, and eleven fenders on the front face. From the cribwork shorewards, to the end of the public road, an approach 162 feet long, 15 feet wide and about 4 feet high was built, across the flats, of brush and earth covered with 6 to 9 inches of stone, with a low bank of stakes, brush and clay to protect it along the north side. In front a bed for vessels, 80 by 25 feet, was constructed, partly on the remains of the old wharf which was cut down, and partly of new cribwork filled with brush and stone. A stairway was built on the lower side of the pierhead. The work was completed on June 30, 1905.

The expenditure for the fiscal year 1904-05, is \$999.80.

## HOPEWELL CAPE.

Hopewell Cape ballast wharf near the mouth of the Petitcodiac, and the head of deep water navigation, is one of several works on that stream, intended for the convenience of shipping.

For the use of vessels proceeding to Moncton, Hillsborough and Dorchester for cargoes, the department, in 1883, began the construction of a ballast wharf of round cribwork, 300 feet in length, and 22 feet wide, which was completed in the following year. In 1885, the work was extended to the present length of 583 feet by an addition built of square timber. The covering, stringers and other upper timbers having become decayed, preparations were made in 1899-1900 (the appropriation being very small) for repairing the work by purchase of materials. By the end of that year a part of the timber had been delivered.

In 1900-01, the outer end for a length of 288 feet was rebuilt for a height varying from 4 to 5 feet. The top of the pierhead was also rebuilt.

By a fire, which destroyed part of the village of Hopewell Cape, the top of the inner end of the ballast wharf, 300 feet long, was burned. The fire obtained lodgment in the decayed internal timbers of this work, and was with difficulty extinguished in time to save the outer end of the wharf, which is built of square timber.

During the fiscal year 1903-04, the burnt timbers of the ballast wharf were removed, and the square cribwork was rebuilt from three to six tiers in height to the level of the stringers. The round cribwork was also rebuilt for a height of two tiers, and was brought up to the level of the under side of the stringers, the voids under the lower ballast floor being filled with stone. Brush mattresses were laid and the construction of a stone embankment, to replace 200 feet of the burnt cribwork, was begun.

In 1904-05, the restoration of the burnt work was completed, by the completion of the stone embankment, 200 feet long and 15½ feet wide on top, with laid slopes. The embankment was made by first placing stone beneath the lowest ballast floor of the burnt cribwork, by neatly laying the slopes of large stone, founded on brush mattresses, and by covering the work with small stone, topped with gravel. From the remaining 100 feet of round cribwork, the burnt and decayed timbers were removed,

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and the work was rebuilt for an average height of two face timbers. For 83 feet the square cribwork was rebuilt and covered, for a mean height of  $3\frac{1}{2}$  tiers; six new mooring posts were put in; a ladder was placed against the side of the work, and the steps were repaired. A balance of \$400 remaining was applied to placing stone and brush at the new wharf.

The expenditure during 1904-05, was \$1,999.92.

The total expenditure to June 30, 1905, is \$14,356.57.

## HOPEWELL HILL.

Hopewell hill, Albert county, is situated on the Shepody river, an arm of the Petitediac, 14 miles from Hillsborough.

In 1902 and 1903, a wharf, 101 feet long and 40 feet wide, of round timber cribwork, was built by the department.

During the last fiscal year, the top of the outer block, and of the adjoining span, which had settled, was built up level; a bed for vessels, along the front of the wharf, was also built to a height of 8 feet.

The expenditure for the fiscal year 1904-05 was \$691.09.

## LAMEQUE.

Lameque, Gloucester county, is a fishing and farming settlement of about 375 inhabitants, on Shippegan island, on the eastern side of Shippegan harbour.

In 1899-1900, a contract was entered into for the construction of a wharf 990 feet long, consisting of an approach 220 feet long, 16 blocks 25 feet square, 20 feet spans, and a pierhead 30 x 40 feet, all of round timber open cribwork. The depth at the outer end of the wharf being 9.8 feet at low water. The contract was completed in January, 1903.

As it was found that the wharf did not afford sufficient accommodation for the numerous fishing vessels and foreign vessels in the fish trade that would make use of it, an extension to the pierhead southerly, consisting of a cribwork block 75 x 30 feet, was begun in September 1904, and at the close of the fiscal year had been built to a height of about 14 feet and sunk in place. The angle, between the last span of the approach and the projection of the original pierhead, was also filled in with stringers, covering and cap.

The expenditure for the fiscal year amounted to \$3,999.80.

The total expenditure to June 30, 1905, is \$15,330.93.

## L'ETANG.

L'Etang, in the county of Charlotte, is one of the best harbours on the coast of New Brunswick, and according to the Admiralty sailing directions, one of the most convenient in North America, in point of entrance, capacity, shelter, depth and holding ground. The harbour is famous for sardines.

Spring tides rise  $23\frac{1}{2}$  feet.

In 1899, the department extended the provincial government wharf of block and span work by building a pierhead, 30 feet long, 20 feet wide and 25 feet high, standing in 20 feet at high water.

During the half year 1904-05, the second block of the old part of the wharf was raised by the addition of three cross-ties and as many longitudinals. Five rows of new stringers were laid for a distance of 60 feet, the fourth block was raised by the addition of one cross-tie; new covering was laid for a distance of 83 feet and the old covering was relaid for a distance of 31 feet, the repairs extending over a distance of

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143 feet. The bents of the trestle approach to the pierhead were repaired by the renewal of five posts and the addition of 20 fenders.

The expenditure during the fiscal year 1904-05, was \$252.45.

The total expenditure to June 30, 1905, is \$735. 57.

#### LITTLE SALMON RIVER.

Little Salmon river, Albert county, a tidal inlet of the Bay of Fundy, fourteen miles east of Quaco, is the site of a mill, producing lumber to the value of about \$25,000 annually.

The beach protecting this little haven, being in danger of denudation, a protection work, 430 feet long, with a groyne 92 feet long, of piles and planking, was built along the crest of the beach in 1902-03.

In 1904-05, two new groynes, each 90 feet long, were built, and the original one near the channel was repaired.

The expenditure for 1904-05 was \$511.96.

#### LOGGIEVILLE.

Loggieville, in Northumberland county (or Black Brook as was formerly called), is a thriving village of about 600 people, on the southern side of the Miramichi river, six miles below Chatham, and is the terminus of the Fredericton branch of the Intercolonial Railway. A steamer of the Miramichi Steam Navigation Company calls here twice daily.

In 1901, a wharf was constructed under a contract, consisting of a stone approach 175 feet in average length and 20 feet wide on top, a span of 15 feet, and a pierhead of close-faced cribwork 40 x 25 feet. This work lies immediately below the so-called 'Bentley Wharf,' and projects 49 feet beyond the face of the latter.

During 1902-03, slight damages to the approach, caused by a storm and extra high tide, were repaired and a plank walk 3 feet wide was laid along it. A pile bulkhead, 18 feet long and 9 feet wide, braced with walings and ties, was built from the lower corner of the Bentley wharf to the inner end of the span of the departmental work, the whole space, 120 feet long and from 10 to 20 feet wide, between the two wharfs, was filled with brush and stone, the top was finished with gravel level with the top of the departmental wharf.

The Bentley wharf and a right of way from the public road were acquired in 1903-04. The outer and upper faces of the Bentley wharf were rebuilt with cribwork, covered, 12 to 16 feet wide, with 4-inch plank. The inner portion was filled with brush, stone and gravel to the level of the covering, making the whole from  $3\frac{1}{2}$  to 4 feet higher than before.

A new pile wharf, to fill the angle between the Bentley wharf and the departmental block and increase the frontage of the latter from 40 to 96 feet, was constructed for a width of 29 feet, covered with 4-inch plank and partly filled with brush and stone. Part of the piles were also driven and braced for the remainder of the wharf, and a bulkhead of piles and posts was built, to prevent material placed in the new work from sliding into the span behind the departmental block.

In 1904-05, an approach 505 feet long was built from the highway to the public wharf, consisting of 163 feet of grading and 342 feet of cribwork. The graded roadway is 22 feet wide on top with side slopes of  $1\frac{1}{2}$  to 1 and ditches on either side. The cribwork is 22 feet wide with sides plumb and consists of an average of two tiers of round timber, with six stringers, 4-inch planks and 10 x 10-inch caps on 3-inch chocks.

The pile wharf was also completed with a frontage of 56 and a depth of 49 feet. The outer main piles, the fender piles and the 6-inch sheathing between the pile-bents, is filled to from  $3\frac{1}{2}$  to 4 feet of the top with brush, stone and earth. The whole

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is covered with 4-inch plank. To protect the creosoted fender piles, short hardwood fenders were bolted at their sides.

Several sunken timbers and a rock which were dangerous to vessels were removed from outside the wharf.

The expenditure for fiscal year amounts to \$3,500.24.

The total expenditure to June 30, 1905, is \$14,304.41.

## LORD'S COVE.

Lord's Cove, Charlotte county, a small fishing station on Deer Island, is a port of call for steamers plying between St. Stephen, St. Andrews, Eastport and other points in Passamaquoddy bay.

To afford facilities for this steamer, the construction of a wharf was begun in 1900-01.

Spring tides rise 24 feet.

The wharf, without the approach, is intended to be a pile and trestle work, 328 feet long and 21 feet wide, with a pier head 33 feet in height.

During the fiscal year 1902-03, this wharf was extended to the back of the pier head, a length of 120 feet by driving twelve bents and by completing the laying of the covering and the cap. A gallows-frame ladder, and flight of steps were also made, in order that the public might make immediate use of the wharf.

The work was then 289 feet long, exclusive of the stone approach, 28 feet in length.

In 1904-05, the pierhead, 50 x 40 feet was built, to which seventeen fenders and fifty-eight short braces yet remain to be applied, the work is now 328 feet long and 21 feet wide, with a pierhead 35 feet in height. The wharf is approached by a stone embankment, 28 feet long, and a rock cutting 61 feet in length.

In 1904-05, materials for a movable slip were ordered. The expenditure during the fiscal year 1904-05 was \$212.38.

## MISCOU.

Miscou harbour, Gloucester county, lies between Miscou and Shippegan islands.

The population of Miscou island is about 500, occupied chiefly in fishing. About seventy-five fishing boats are owned in the island and there are eleven lobster factories.

On April 27, 1904, a contract was awarded for the construction of a wharf at this place. The work will consist of a shore block 200 feet long by 20 feet wide, eighteen blocks 20 feet square, nineteen spans of 20 feet square and a pierhead 40 x 30 feet. The contract price is \$13,700.

Work was begun in May and by June 30, 1905, the cribwork of the approach had been built to full height. Blocks one to twelve had been placed and built from eight to six tiers high. The pierhead was begun and built three tiers high.

The expenditure for the fiscal year 1904-05, was \$3,490.30.

The total expenditure to June 30, 1905, has been \$3,564.02.

## MUD COVE.

Mud Cove, Albert county, is an inlet of Grindstone island, in the Petitecodiac.

To shelter the boats of the lightkeeper and others, the construction of a small breakwater was authorized. Timber and iron for the work were procured during the fiscal year.

The expenditure to June 30, 1905, is \$491.57.



## NEGRO POINT.

Negro Point is a headland about 60 feet above high water mark, at the western entrance to St. John harbour, which is formed by the estuary of the River St. John, on the northern side of the Bay of Fundy.

Spring tides rise 25·33 feet. Neaps, 15 to 20 feet.

In addition to convenience of position for distribution by rail of cargoes landed at the city of St. John, the harbour is remarkable principally for great tidal range, and for consequent freedom from ice in the winter months. The harbour is open, broadly speaking, from south-east to south-west, but southerly winds are broken by Partridge island, and south-west waves are mitigated by Negro Point breakwater, while the foul ground, a shoal tailing down from the peninsula on which the city is built, must have more or less effect in moderating the force of the easterly seas rolling around Mispec point.

By Partridge island, a rocky eminence devoted to quarantine and light-house purposes, the entrance to St. John harbour is divided into east and west channels. In the former or main channel, a minimum navigable depth of 19 feet is found on the bar at low water at ordinary spring tides. Two hundred yards inside the crest of the bar, a depth of 5 fathoms is obtained in the narrow fairway, while higher up and between the most southerly of the principal wharfs on either side of the harbour (450 yards wide at that point), 12 fathoms are given in mid-channel. The west channel 10 to 14 feet deep at low water, and originally 1,200 yards wide, has been contracted to about as many feet in breadth by Negro Point breakwater, which extends 2,200 feet S.E. by S. from the headland so styled.

The reasons for undertaking this work are thus stated in the reports of the Minister of Public Works for 1875 and 1882 : '1875. This breakwater extends south-easterly from Negro Point at the western entrance of St. John. When completed it will extend a distance of 2,250 feet closing up the west channel to that extent, leaving, however, a width of 1,100 feet between the outer end and Partridge island. The object is to break the force of the seas which roll into the harbour of St. John during the south-west gales in the Bay of Fundy, and which render it dangerous and almost impossible at such times for vessels to make the harbour.

'1882.—South-westerly winds threw in a heavy sea through the western channel which rendered it difficult for vessels to make the harbour, as they were in danger of being carried on the foul ground on the eastern side of the channel. In the spring of 1875, a breakwater 2,250 feet long to partially close the western channel was begun, and in September 1877 completed'.

Reference to the chart will show that as long as the present opening remains, the object of the breakwater has been only partially fulfilled. In dealing with the reduction of the bar, a more cogent reason than improvement of shelter may be found for the extension of the work to Partridge island.

The breakwater consisted at first of a cribwork core, 30 feet wide at the base 15 feet wide at the top (5 feet above high water ordinary spring tides), protected on both sides by large stones sloping seaward at the rate of two to one, and landwards at the rate of one to one. In the month of February 1879, thirteen hundred lineal feet of cribwork were swept away to a depth varying between 13 and 19 feet from the top, the stones having been raked down by the wave-action to a slope more nearly resembling the angle of repose of the material. In 1880, temporary repairs were made, and in 1881 a contract, completed six years afterwards, was entered into whereby the lost cribwork was replaced by heavy stones, and the seaward slope made three to one. Even this flatter inclination proved too steep for stability ; consequently, notwithstanding their size, the stones, though smoothly laid, were soon displaced by the sea. A length of 50 feet of the breakwater extending at full height beyond a masonry pier, built under the same contract to support a beacon, was also swept away. From 1891 to 1894 desultory repairs were made by the addition of large stones, chiefly deposited about the end to prevent the light-house from being undermined.



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In May and June 1895, four large blocks of concrete were placed for the same purpose in front of the base of the pier. In 1895-96, seven concrete blocks, founded about the level of low water neaps, were built in situ around a quadrant of the outer end to receive the foot of a slope proposed to be made of heavy granite blocks laid at the rate of four to one. The concrete blocks were from 59 to 91 tons each in weight, all but the heaviest being made in one tide. The granite pier was also reinforced by a semicircular skin of concrete 7 feet in average thickness and strongly battered, placed around the front, and brought to the level of high water springs. The footing blocks were 15 feet long, 12 feet wide and unless varied for the sake of foundation, three feet high in the face, sloping upward at a rate of four to one on the top. Each block was free to settle independently, but all were keyed together by splayed concrete joggles. Inside a part of the space within the quadrant, stones of the original work added to small granite were assembled and grouted, as far as funds permitted. This course was taken in default of the heavy granite (which would require special plant) necessary for the slopes of this breakwater, where weight is the great desideratum.

Pending consideration of works necessary for deepening the entrance to the harbour, which might possibly involve the extension of the breakwater, nothing more was done during the year 1896-97 (except the completion of the break at the shore end), than appeared requisite to protect the unfinished superstructure just begun, and to preserve the light-house.

To this end fifteen blocks of concrete, forming aprons, were laid in position at the outer end of the work, between October, 1896, and June, 1897. A quantity of stone which had been swept around the point of the breakwater from the seaward to the harbour side was also replaced in position. Some of this stone was laid outside the heavy footing blocks, built in the previous year, and some was applied to restoration of the crest of the work at the back of the lighthouse. Breaches carried below the level of high water had been made by the sea at five or six points in the rubble mound between the lighthouse and the shore. An illustration of the violence of the seas which assail Negro Point breakwater is afforded by the removal of a stone, which weighed five tons, a distance of 76 feet in one winter. A marine dynamometer secured to the masonry of the lighthouse records the wave force at 4,000 pounds and upwards per square foot.

In order to retain for natural protection, along the seaward face of the work, the littoral drift formerly swept by the waves over the top into the harbour, a break of piles, brush, stone and timber, 270 feet long, 8 feet wide, and 4 feet high, begun in 1895, was completed in 1896-97, and was also extended 140 feet along the timber work that year with good effect. As a result of the construction of the break, the foreshore has advanced seaward, while the beach has increased in height and breadth.

Besides the general accretion of the beach, a tongue of drift, observed after the erection of the break to be near the shore, has at the foot of the talus on the seaward side travelled 200 yards or more toward the outer end of the breakwater.

The formation of this spit, generally 10 feet wide and 2 feet high against the work, indicates that the drifting sand, gravel, shingle, &c., which formerly went over the breakwater into the harbour will in time afford important natural protection to the work, and will reduce the length of the face to be maintained.

During the year 1897-98, as a measure of precaution, 152 yards of granite were obtained and deposited about the lighthouse for protection during the winter, while stones previously removed by the sea were replaced in position.

The advance of the foreshore rendered necessary in that year the enlargement of the timber break, which was extended a distance of 80 feet along the breakwater.

A small groyne was also built for the purpose of obtaining some information as to the quality of the littoral drift near the shore end. To preserve the timber, the top of the piles and the knees of the break were given two coats of pitch.

One thousand and nineteen cubic yards of granite were supplied and laid in place in 1898-99; while 285 yards of the original stone of the work, displaced by the sea, were restored to position.

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During 1899-1900 four hundred and fourteen cubic yards of granite were delivered and placed around the lighthouse. Six hundred and six cubic yards of dislodged stone were put back. Five concrete blocks, containing 52.1 cubic yards were also made in place.

In 1900-01, five blocks of concrete aggregating 54½ cubic yards were built in situ; 1,313 cubic yards of new granite were received and placed. While 1,893 cubic yards of the original stone of the breakwater, removed by the sea (which on November 8, 1900, made two clear breaches through the work), were restored to position. The timber break was also extended two tiers for a distance of 40 feet.

During the year 1901-02, four thousand six hundred and ninety-four cubic yards of the large stone, principally granite, together with 719 cubic yards of small stone, were delivered, and placed in position. A number of large stone of the original work, amounting to 1,713 cubic yards which had been dislodged by the sea, was restored to place by means of a floating steam derrick. Repairs were also made to the derricks and buildings.

During the fiscal year 1902-03, 4,603 cubic yards of large, and 600 cubic yards of small stone were delivered and placed at Negro Point breakwater. This material was chiefly applied to restoring the point of the breakwater to the original length; that is by extending it 50 feet beyond the lighthouse. Although the stones were of large size, averaging a little less than 1½ cubic yards (while some attained the bulk of 5.6 and even 7 cubic yards each), a part of the restored point was swept away by the heavy storms of the winter. Besides the new material added to the work, 2,201 cubic yards of the original stone of the breakwater, which had been dislodged by the sea were by standing or floating derricks shifted and replaced either on the point of the breakwater or in the gaps made in the crest. The covering of the cribwork was also patched in places, the plant overhauled, and a derrick for hoisting boats erected near the shore end.

Until the work has either been extended to Partridge island or has received a permanent superstructure, constant repairs will be required.

In 1903-04, twelve blocks of concrete, aggregating 417 cubic yards, were made in place. Before the concrete was made, 124 cubic yards of large stone, taken from another part of the work, were placed around the lighthouse for protection. The break was raised 2 feet in height for a length of 175 feet.

During the year 1904-05, 1,123 cubic yards of granite were delivered, a stone-breaker was hired, and the whole was crushed to the size required for concrete. Thirteen large blocks of concrete, aggregating 599 cubic yards were made in place; 519 stones averaging ¾ cubic yard each, which had been dislodged by the sea, were replaced in position; a boat landing was built of concrete; a lighter, 43 feet long and 15 feet wide, was built for transporting material from the shore to different parts of the work; a plank walk, 900 feet long and 4 feet wide, covered with two coats of carbolineum avenarius, was laid along the top of the works, below Fort Dufferin, to give access to the works of Negro Point; new derricks were made; the roofs of the buildings were repaired, and the plant maintained generally.

The total expenditure to June 30, 1905, is \$547,405.35.

The expenditure during the fiscal year 1904-05, was \$19,994.91.

#### PARTRIDGE ISLAND.

Partridge Island is a rocky eminence standing at the mouth of St. John harbour, and dividing the entrance into east and west channels. The island is devoted to quarantine and lighthouse purposes.

At the northern end of Partridge island, two narrow piers of cribwork, built many years ago, give shelter to the boat landing at the station. Between them, a substantial block of new cribwork, 50 feet long and 22 feet wide, begun and nearly finished in 1896-97 as a foundation for the disinfecting house was completed in the

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succeeding year. A boat slip, intended for use at low stages of the tide, was partially built; a new mooring-post was put in, and minor repairs to the end of the west pier were made at the same time.

In the fiscal year 1902-03, the west pier of Partridge Island, 121 feet long and 17 feet wide, was raised by the addition of one tier of cross-ties, new stringers, covering and cap. A house 14 x 24 feet was built for the boat of the medical officer, and a new derrick, excepting the mast, was made for the purpose of launching or landing the boat, the weather being too rough in the winter to allow it to lie afloat.

From the east pier, 110 feet long and 20 feet wide, 11 fenders were removed and were replaced by new ones. The break was strengthened by the addition of seven new knees; the boat-shed was shifted; the derrick rebuilt and a new cap laid. The top was covered throughout with two thickness of 2-inch plank.

During the fiscal year 1903-04, the approach of round cribwork to these piers was reconstructed. This part of the work is 73 feet long on the centre line, 16½ feet wide on top and 14 feet high, with an additional platform 17 x 18 feet. The top was covered with hemlock plank and a hand-rail was put around it. Ballast floors 30 feet in length, composed of double deals, 3 inches thick, were placed in the west pier and covered with 4 feet of ballast. Five bays of the inner-face were sheathed to prevent the loss of ballast, for a height of 8 to 18 feet and the ballast, which had been washed into the slip and obstructed the boat landing, was removed.

In 1904-05, the faces of the piers were sheathed for a length of 110 feet; a slip was built, a gangway made, and the ladders were repaired. A small block for the landing of immigrants was built on the outside of the west pier.

The expenditure during the last fiscal year amounted to \$3,127.98.

## PETIT ROCHER.

Petit Rocher, Gloucester county, is a farming, fishing and lumbering settlement, on the south-western side of Baie des Chaleurs, twelve miles above Bathurst.

To provide shelter for the fishing boats of the district, for those crossing from Bonaventure county, P.Q., and for vessels engaged in lumber carrying and general trading in Baie des Chaleurs, a contract for the construction of a breakwater, was awarded on May 31, 1904.

The work will consist of a main breakwater, 209 feet long on the outside face, and an 'L' placed at an angle of 74° 30' with the main part, 160 feet long on the outer face. The width on top will be 30 feet. At the nearest point the breakwater will be 450 feet from the shore, it will lie in from 12 to 19 feet of water, at L.W.O.S.T. The contract price is \$32,900.

Work was begun on March 18, and by the end of the fiscal year, two cribs had been built and sunk in place, the first, 96½ feet long, 36 feet wide at the base and 21 feet high, filled to within a foot of the top with ballast; the second, 41 feet long, 35 feet wide at the base and 15 feet in mean height, about half filled with ballast.

In October, 1904, the road from the public highway to the shore, a distance of about 860 feet was graded, the excavation amounting to about 350 cubic yards; ditches were made on both sides of the road; 81 rods of wire fence were erected on the north and part of the south sides, and a bridge of 12-foot span and 20 feet wide, resting on cedar abutments, was built where a stream crossed the road. In the spring of 1905, the new road was gravelled and slight repairs were made to the fence.

The expenditure for the fiscal year amounted to \$7,195.91.

## POINT DU CHENE.

Point du Chene, Westmoreland county, lies on the western side of Northumberland straits, on the south-east side of Shediac harbour. It is the terminus of a branch

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line of the Intercolonial railway and for the steamer 'Northumberland' running during the season of navigation from Summerside, Prince Edward Island.

The works at Point du Chene consist of two breakwaters, an inner one and an outer one, each 600 feet long, with an opening, between, of 80 feet, and a ballast wharf 200 feet long, connecting the outer breakwater with the Intercolonial Railway wharf. They have been repaired or rebuilt at various times.

In the autumn of 1902, a storm made a gap in the outer breakwater about 50 feet long. This was in part rebuilt in 1903-04, the cross-ties being replaced at 5 feet intervals, instead of ten as before, and the timbers of the outer face screw bolted together. The top was raised two tiers, or 1 foot 8 inches higher than before.

During the fiscal year 1904-05, the repairs were completed by filling about 22 feet with ballast, laying 4-inch covering for a length of  $24\frac{1}{2}$  feet, 6-inch sheathing for a length of 73 feet on the sloping face, and a 12 by 12 inches cap on each side, 72 feet long. Shorewards of the portion rebuilt, the covering and stringers were found to be loose and floating at extra high tides. The covering was therefore removed at 10 feet intervals over a length of 280 feet, or to the inner end of the breakwater, and the stringers were bolted to the cross-ties. The interior was filled to the top with  $2\frac{1}{2}$  to 3 feet of stone and the covering replaced.

A storm on November 14, 1904, carried away the covering stringers and sheathing for a length of 150 feet outside the repaired part, of which the inner cap and top face timbers were also displaced by moving timbers. These latter timbers were replaced, the wreckage gathered and piled, and two tiers each of longitudinals and cross-ties removed, i.e. to about low water level, from about 130 feet of the damaged portion, for the purpose of rebuilding it. A track and turntable were laid towards the outer end of the outer breakwater, on a temporary timber work, and 73 cubic yards of mixed stone were placed outside the face. Four hundred and sixty-six cubic yards of large stone were deposited over brush outside the inner breakwater.

The expenditure for the fiscal year 1904-05, was \$3,998.06.

#### POINT WOLFE.

Point Wolfe, in the county of Albert, is a small natural harbour on the north shore of the Bay of Fundy, about 57 miles east of St. John. The river mouth gives an indraught from the bay 1,800 feet long and 700 feet wide. The harbour lies at the upper end of the embouchure, and is formed by a beach or bar thrown up by the sea, 1,000 feet long, 200 feet wide, and 14 or 15 feet higher than the flats. The crest of this bar was being washed away by the waves to the detriment of the basin inside.

A contract was accordingly let in 1900-01, for the erection of protection works, 880 feet in length, intended to prevent further denudation and to effect restoration of the beach to the original height.

Construction of the work, which consisted of pile bents, 8 feet apart, and 11 feet wide, partially filled with brush and stones, designed to collect the littoral drift, was completed in December, 1901. The work answered its purpose in raising and restoring the beach generally, with the exception of a part, 280 feet long, near the shore end, which was washed away, to a depth of 8 feet and was repaired chiefly with brush and stone in 1904-05.

The expenditure during the fiscal year 1904-05, was \$497.35.

#### QUACO.

Quaco is on the northern coast of the Bay of Fundy, about thirty miles to the north-eastward of the entrance to St. John harbour. The bay is semi-circular, and lies open to the south-east between Quaco head and Macomber point, some two miles apart, the breadth from a straight line drawn between these capes being about a mile.

At the mouth of a small river discharging into the eastern end of the bay, a harbour of refuge has been formed by the construction of two piers; the eastern work,

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310 feet long, built in 1873, and the western, 302 feet long, built in 1882-83. The harbour is dry at low water and is only accessible for about six hours during each tide, to the coasting vessels which come to load timber or to seek shelter.

Spring tides rise 30 feet; neaps, 23 feet.

In 1886-87, small repairs were made by the expenditure of \$198.53.

The west pier was damaged by a storm in 1889, and repaired in the following year at a cost of \$557.57.

In 1891-92, piers received general repairs, the sum of \$1,350.82 being expended.

In 1893, the west pier was damaged, and was repaired for a length of 100 feet at a cost of \$999.88.

In 1896-97, repairs were made to the west pier for a distance of 149 feet, the sheathing of the sloping face, and several face-timbers, being renewed with birch, 14 inches square secured with screw bolts, and a quantity of ballast being replaced. A couple of fenders and a ladder were also added. At the same time, the east pier was protected from the scour of the stream by brush and stone; thirteen new fenders were applied, and the decayed tops of five others were replaced by sound material.

Small repairs were also made to the covering and sheathing, and another ladder was provided. The whole expenditure in that year amounted to \$1,377.51.

In 1897-98, a sum of \$50 was applied to closing a small opening and strapping the angle of the west pier, which had been struck by a schooner.

In the fiscal year 1902-03, the sloping face of the east pier was reconstructed for a length of 70 feet, the outer end being ten tiers in height, and the inner, seven tiers high.

In 1903-04, the repairs to this face were completed and were extended for an additional length of 19 feet, the whole being covered with sheathing. Four new mooring posts were inserted; a new corner fender was placed, and the cap and covering received minor repairs. Some pieces of sheathing were also placed on the west pier.

In 1904-05, repairs were made to the upper works of both the east and west piers, comprehending renewal of the cap, top tiers, in great part stringers and covering.

The expenditure during the fiscal year 1904-05, was \$1,844.11.

## RICHIBUCTO.

Richibucto harbour, Kent county, lies on the eastern side of Northumberland straits, about midway between the entrance to Miramichi bay and Shediac. It is one of the New Brunswick deal ports, the shire town of the county, and the terminus of the Kent Northern railway.

The entrance to the harbour is between two sandy beaches known as 'North Beach' and 'South Beach.' The works originally proposed for the improvements of the harbour were two breakwaters, one to extend from the southern point of the North Beach, and the other to run in a north-easterly direction from the South Beach, the object being to confine the water to one permanent channel and so scour the bar at the entrance.

In 1873 and 1874, the works were commenced by the construction of a breakwater or pier, 1,200 feet long, off the North Beach. This was subsequently extended westward at various times to stop erosion of the beach up till 1891, when a total length of 2,158 feet had been built.

Between 1891 and 1903, in consequence of damage and decay, repairs and reconstruction were carried on at different sections of the work, and a number of groynes and breastworks were built from both the outside and inside of the main work, to protect the latter and raise the beach.

In 1901-02, an extension to the breakwater was begun and partially built for 130 feet, out of a proposed total length of 315 feet. It begins at a point 300 feet from the original end of the breakwater and runs in a south-easterly direction.

In 1902, a contract was let for the completion of this work and of a protection work running westerly along the harbour face of the old work, for a distance of 800

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feet starting from the inner end of the extension. This contract was completed on November 30, 1903.

The extension consists of brush mattresses, 74 feet wide on the bottom, weighted with small stone, through which three rows of piles, 5 feet apart, are driven, and on which a rubble mound is laid 12 feet wide on top, finished with large stone sloping at the rate of 2 to 1 on the sides.

A further extension 300 feet long of similar construction is now proposed and for this a quantity of materials were procured during 1904-05. The government hoisting engine was also overhauled.

The expenditure for the fiscal year 1904-05, was \$1,002.42.

The total expenditure to June 30, 1905, is \$119,824.20.

#### RIVER ST. JOHN, AND TRIBUTARIES.

The River St. John proper, 450 miles long, takes its rise from sources in the province of Quebec and the state of Maine, at a reputed maximum altitude of 2,159 feet above sea level. Entering New Brunswick at the confluence of the St. Francis, a little below the borders of Quebec, it continues to be the international boundary almost to Grand Falls, and after flowing through the province for nearly 300 miles (by way of the counties of Madawaska, Victoria, Carleton, York and Sunbury, King's, Queen's), discharges into the Bay of Fundy at St. John. Many tributaries, some being of considerable magnitude, are received by the main stream. Among them are the St. Francis, Madawaska, Green river, Grand river, Salmon river, Aroostook, Tobique, Presqu'Isle, Meduxnakeag, Eel river, Mackawick, Keswick, Naskwask, Oromocto, Jemseg (Grand lake), Washademoak Belleisle and Kennebecasis. Except the last five which are slightly tidal for some distance, they are fresh water streams.

The total basin from source to mouth is computed to be 26,000 square miles, an area almost equal to the whole of New Brunswick, but as a part of the water-shed lies outside, only a little more than one-half the province is drained by the river. The St. John is considered navigable for vessels 15 feet in draught for a distance of more than fifty miles from the mouth, but no positive information on this point has yet been obtained. About 8 feet at low water can be carried to Fredericton, eighty-four miles from the sea, and six miles below the head of tide at Springhill. Three nature features of the river are remarkable, viz.:—

The tidal falls, Grand Falls, and the annual floods.

Although in summer the fresh water stream between Woodstock and Fredericton is in places 400 to 1,000 feet wide, expanding at the latter place after reaching tide-level to half a mile in breadth; yet the actual mouth of the river, a rocky gorge 400 yards long, immediately at the head of St. John harbour, measures but as many feet across at high water. Here at low water, the level of the river is from 11 to 25 feet above the sea, and as the ordinary tides flow from 23 to 27 feet the sea level at high water is from 8 to 13 feet higher than the waters of the river. Thus there are two falls at every tide, viz.: one outward and one inward, and vessels can only pass when the waters of the ocean and the river are on a level. This occurs only for a space of about ten minutes during each ebb and flow of the tide, at all other times it is either impassable or extremely dangerous.

At Grand Falls, 223 miles from the sea, the whole volume of the river plunges over an almost perpendicular face of limestone 60 feet high, into a deep ravine 250 feet across, somewhat similar to the narrow pass at St. John. Flanked for nearly a mile by lofty rugged cliffs, the confined current dashes from the foot of the falls with excessive strength, mining deep pot-holes in the rocky bottom of the channel in the course of a further descent, estimated to be slightly less than the first. In the harbour of St. John, ordinary spring tides are considered to rise 25½ feet. At the wharfs of the river steamers, a mile above the falls, while summer range is about 3 feet, the highest flood-mark is given as 17 feet above extreme low water. At Oro-



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mocto, seventy-three miles from the sea where the tidal range is from 10 to 12 inches, the flood of 1887 reached a bridge, 20 feet above low water. At Andover, 200 miles from the sea, floods attain an elevation of more than 27 feet above summer level. By contrast the Tobique and St. Francis swell 9 and 6 feet respectively. After the first spate, due to the melting of the snow in the catchment basins of the Kennebecasis, Belleisle bay, and Washademoak, a secondary flood occurs, caused by the back water of the main river, which is fed from sources farther north, and consequently later in thawing.

The harbour of St. John is open all the year round, but the river is ice-bound from November to April, an average period of 144 days. The water usually begins to rise in April, reaching flood-pitch early in May, and maintaining a high level for two or three weeks. By the middle or end of July, the water has fallen to summer level, a stage lasting, with some variations, dependent upon the rainfall, for about sixty or seventy days.

In addition to a little coal, a considerable quantity of cordwood, and the ordinary food supplies yielded by the farms of a lengthy fertile valley, the trade of the river comprehends an abundance of valuable timber, fluctuating each season in amount, but generally at least equal to 135 million superficial feet annually. Most of the logs are floated loose down the tributaries and upper river to Fredericton, some being manufactured there and shipped coastwise or to the United States. The remainder, or major part, is towed from the provincial capital to St. John in rafts, giving employment to a fleet of tugs.

For the purpose of works, three divisions may be made of the river :

1. Tidal navigation, for steamers and sailing vessels, between St. John and Fredericton, eighty-four miles, requiring 11 feet at low water. Principal obstructions: the Oromocto shoals, about one and a half miles; the middle ground above Oromocto island, about one mile, and the shoals abreast Fredericton, rather more than one-half mile in length. The last are now dredged, but the other obstacles remain.

2. Inland navigation, from Fredericton to Woodstock, distance of about sixty-five miles, requiring  $3\frac{1}{2}$  feet at low water. The obstacles to inland navigation, besides boulders in some places, and perhaps bed-rock at Meductic, are shoals of material more or less coarse, according to the strength of the current, varying in composition from sandy gravel to stones. The chief bars are at Springhill and Bear island; while Knapp's, Perley's, Coac, Mackawick, Belvisor, Moore's, Bett's, Dibblee's and Bedell's bars, with Meductic rapids, constitute, according to present information, lesser obstructions. Dividing above Springhill into two main channels and from a general width of 350 yards opening to a stretch of one and a half miles between banks, with a water-way increased by at least one-third, the river becomes dotted with eyots and shallows. Two gravel shoals, known as the Russel and Chapel bars, together about one-half mile in length, compose the obstacle at Springhill. At Bear island, twenty-five miles above Fredericton, in consequence of another division of the river into three channels aggregating 600 yards in breadth, a shoal of gravel and stones one mile long, giving 21 inches at low water, has been formed. Besides dredging a long training dyke will be necessary for the maintenance of this channel. After reuniting below the island, the width of water-way in single channel is only 250 yards.

3. The Upper river, including with the tributaries, all that part above Woodstock. This division is now used for the passage of timber only. On some of the tributaries beyond the reach of the railways, supplies for the lumber camps are transported in tow-boats, for which channels are required to be made and tow-paths provided.

## SECTION 1.

Tidal Navigation.—The tidal compartment of the River St. John comprehends besides the main stream navigable by steamers which run daily between St. John and



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Fredericton, a distance of eighty-four miles, four tidal arms, all navigable by wood boats and regular passenger steamers, the extent of the whole tidal navigation being as follows :

Main River St. John. . . . .	84 miles long.
Kennebecasis. . . . .	24 "
Belleisle bay. . . . .	12 "
Washademoak lake. . . . .	27 "
Grand lake and Salmon river. . . . .	35 "

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Total extent. . . . . 182 miles

For the convenience of the steamers and other craft navigating the main river and its branches, the provincial government has erected a number of wharfs, towards which the department has made contribution amounting to one-half the certified cost.

During the year 1901-02, assistance was given to a number of these wharfs, \$3,000 being available for that purpose ; while in the fiscal year 1902-03, \$4,813.14 was applied to the same object.

A contract was signed on January 22, 1903, for the construction at Oromocto of a public wharf which was begun and completed in 1903-04. The new wharf is of round cribwork 300 feet in total length with an approach 20 feet on top, battered at the rate of one to one on the upper side, and sheathed. The pierhead is 70 x 35 feet on top. The work is filled with ballast. A road 130 feet long, was made from the old wharf to the new.

The upper river, comprehending many branches, including the Tobique, Green river, St. Francis, &c., &c., extends from Woodstock to the north-western boundary of the province. Navigation on the upper river is confined to the passage of timber and rafts, or to the tow-boats which convey supplies up the streams, from the end of the railways to the lumber camps, situated beyond the lines of ordinary communication.

#### MAIN RIVER.

Mouth of Tobique to River des Chûtes.—Between the mouth of the Tobique and River des Chûtes, 125 cubic yards of rock were removed by blasting.

The expenditure during the year amounted to \$199.92.

Salmon river to mouth of Tobique.—Between Salmon river and the mouth of the Tobique, 92 cubic yards of rock were removed by blasting.

The expenditure during the year amounted to \$150.

Grand Falls to Salmon river.—Between Grand Falls and the mouth of Salmon river, 103 cubic yards of rock were removed by blasting.

The expenditure during the year amounted to \$150.

Grand Falls.—At Grand Falls, a road was cut down to Grenier's Eddy and 175 cubic yards of rock were blasted.

The expenditure amounted, during the year, to \$498.84.

Tobique river.—On the main Tobique between Plaster Rock and the forks of the Nictau, channels from 60 to 75 feet wide and 4 feet deep, aggregating 6,710 yards in length, were made ; 40 rocks (33 cubic yards) were blasted, trees, and stumps along the bank, obstacles to towing, were removed, and at Knowlton's Flats, a cribwork dam, 210 feet long and 24 feet wide and 8 feet high, was built.

The expenditure during the year amounted to \$2,273.12.

Little Tobique river.—The stream was cleared from Lawson's camp to the foot of Nictou lake, a distance of ten miles, and a towpath 10 feet wide was cut on one side.

The expenditure during the year amounted to \$200.

Quisibis river.—A sluice for timber, 110 feet long, 8 feet wide and 4 feet high, was repaired with 26 spruce logs, 18 feet long. A new gate, 8 feet high and 6 feet wide, was besides placed in the dam.

The expenditure during the year amounted to \$183.75.

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Little Forks, Quisibis river.—On the Little Forks of the Quisibis river, a tow path, 10 feet wide, was cut and cleared on both sides for two miles up the stream from The riault's landing.

The expenditure during the year amounted to \$50.

Little Forks, Green river.—At Little Forks, Green river, 32 cubic yards of rock were blasted.

The expenditure during the year amounted to \$50.

Little Forks, Iroquois river:—From the rapid, one and a half mile long, situated one mile from the mouth of Little Forks, rocks were cleared from the stream and for two miles above the rapids, trees were cut. From the second rapid, three-quarters of a mile long, forty-two rocks (37 cubic yards) were blasted; stones were hauled ashore and a tow-path, three-quarters of a mile long and 12 feet wide, was made.

The expenditure during the year amounted to \$225.03.

Trout River.—A tow-path, 6 feet wide, was cut and cleared from the mouth of the Little Forks of Trout river on both sides of the stream, to within one-half a mile of Quebec boundary, a distance of eight miles. Some pine stumps and 12 cubic yards of rock were blasted along the river bank and at a mile from Trout River a cribwork dam, 100 feet long, 10 feet wide and 4 feet high, partially ballasted, was built.

The expenditure during the year amounted to \$150.

St. Francis river.—Channels, 150 feet long, 20 feet wide and 3 feet deep, were made through three bars above Gross Lake rapids. Two channels, each one-quarter of a mile long, were made through the rapids. One channel, 165 feet long, 20 feet wide and 3 feet deep, was made through a bar below the rapids; a channel, 200 feet long, 20 feet wide and 3 feet deep, was made through two bars above McKeown's pond, besides three tow-paths severally one-quarter of a mile long, 300 feet long, and 82 feet long.

The expenditure during the year amounted to \$200.

St. Hilaire.—At St. Hilaire, a washout, 140 feet long, 15 feet wide and 5 feet deep, was filled in by depositing 388 cubic yards of stone.

The expenditure during the year amounted to \$193.50.

The expenditure during the fiscal year 1904-05, amounted to \$5,108.58.

Exclusive of the cost of dredging, the total expenditure on the River St. John to June 30, 1905, is \$174,442.86.

## SHIPPEGAN.

Shippegan gully, Gloucester county, a passage between Shippegan island and the mainland, is situated on the western side of the Gulf of St. Lawrence, and is distant three miles south-east of Shippegan village, the terminus of the Caraquet railway, and sixty-five miles east of Bathurst, the shire town of the county.

To improve the entrance to the harbour, the department in 1875 commenced the construction of a breakwater on the eastern side of the gully, and a dam 890 feet long to close what is known as the eastern gully, distant three-fifths of a mile eastward of the main gully.

From 1875 to 1890, the works were confined to the eastern side of the entrance, and at the latter date consisted principally of a pier or breakwater at the point, and a breastwork along the northern face of the beach, the whole having a length of 1,220 feet, one-third of which was constructed of cribwork and the remainder of brush and pile works.

In 1880-81 and 1883, the dam was repaired, raised and strengthened, and during the latter year the pier was also repaired and extended 120 feet.

General repairs were again made during 1883-84 and 1886-87. In 1888-89, the work was further extended 50 feet by the construction of an additional block at the outer end.

During 1890-92, a contract was entered into for the construction of a breakwater 1,194 feet long, off from the western beach, consisting of a pile-work filled with

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brush and stone; 137 feet of the outer portion of the eastern work was rebuilt at the same time.

In 1892-93, repairs were continued and in 1897-98 plans were prepared and general repairs to all the works undertaken. These were continued until the winter of the following year, and consisted of raising and widening the dam, extending it 185 feet and building short groynes along its northern side; building a number of short works at points between the dam and the east breakwater of stakes and brush, or piles, brush and stone, for the protection of the beach, and a structure 90 feet long, composed half of a close-faced block and half of pile-work, to close a gap in the main breakwater. Along the west beach a breastwork 1,669 feet long of stakes, piles, brush and gravel was constructed to close the runnels and raise the crest of the beach.

In 1899-1900, the gap of 90 feet in the east breakwater was completed and the work of raising and widening the dam continued, further beach protection works were also constructed on the east beach.

A new 44 x 34 feet block was built in 1900-01, at the outer end of the eastern breakwater, the ballasting being completed in the following year. Additional breastworks were built on the west beach, and the western breakwater was strengthened with braces and horizontal sheathing, and extended 100 feet shorewards. This work was continued in 1901-02 and the breakwater extended a further distance of 175 feet shorewards by driving close-piles backed with brush and stone.

On the east beach in 1901-02, a beach protection work was built, 1,826 feet long, easterly from the dam towards the breakwater, and the dam was raised  $3\frac{1}{2}$  feet for a length of 350 feet; one groyne was built and another begun on the harbour side of the beach.

In 1902-03 and 1903-04, the building and repairing of groynes and breastworks was continued, an extension of 1,200 feet being added to the breastworks of the west beach, and 500 feet built on the seaward side of the east beach. Slight repairs were also made to the two breakwaters.

In 1904-05, twenty-nine piles were driven close around the south-east corner of the east breakwater, where the original close-piles had been undermined and the ballast washed out. The interior was then filled with brush and stone. Block No. 2 was refilled with stone, where necessary, about 50 cubic yards being required, and covered with plank for a width of 10 feet on the outside. Inward, from block No. 3, 150 feet of the seaward face of the work was close-piled outside two new walings, and the interior was filled with brush, stone and gravel.

The breastworks on the harbour side were repaired for a length of 250 feet by filling them with brush and stone, and extended eastward 325 feet with a picket and brush fence, to replace an old work that had gone to decay. Two short groynes, 22 and 25 feet long, were built on the harbour side, and one old groyne was cut down at the outer end, so as to be secured from lifting by the ice.

On the west side the broken timbers, brush and stone were removed from the west breakwater for a length of about 50 feet, where damaged by the ice last spring. Piles were driven inside the work in eleven bents of three to five piles each, to which three 10 x 12 cross-ties were bolted at each bent, and a new face,  $54\frac{1}{2}$  feet long, was formed on the harbour side, on which the ice strikes with greatest force, by driving hardwood close-piling 10 inches thick, secured to three walings which were in turn bolted to the piles. Brush and stone were placed within and the old covering relaid. An old groyne, damaged by the ice, was cut down at its outer end.

A new pile block, 77 feet long on its centre line and 24 feet 4 inches in extreme width, was begun on the inside of the west breakwater, 100 feet from the outer end. Its length is about in the direction of the channel now being dredged, and, it is intended to act as a groyne to form a beach inside it, along the breakwater, to protect the latter from ice drifting down the harbour and to direct the current against a bar, inside the entrance, and so straighten the channel. At the end of the fiscal year,

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the sixty-six main piles had been driven and walings, chocks, and horizontal braces placed. A quantity of ballast and brush and 10 x 10-inch hardwood close-piling was also obtained for the work.

The expenditure for the year amounted to \$7,755.42.

The total expenditure to June 30, 1905 is \$95,809.71.

## STONEHAVEN.

Stonehaven, formerly Clifton, in the county of Gloucester, a station on the Caraquet railway, is situated on the southern shore of the Baie des Chaleurs, eighteen miles east of Bathurst, and eight miles west of Grande Anse.

A breakwater at Stonehaven, originally 425 feet long and constructed by private persons was acquired by the department in 1878, and during the same year was extended 325 feet, making a total length of 750 feet. The outer 220 feet is placed at an angle of 72 degrees with the inner portion; the whole construction is of round and square timber cribwork, filled with stone and protected along the northern and eastern faces by a stone talus. The harbour affords shelter for fishing vessels and for schooners engaged in the export of grindstones, &c.; the depth at low water is 7 to 8 feet. Spring tides rise 7 feet.

Between 1886-88 and 1891-93, and annually since 1897, general repairs have been made to the work; large stones of from one-half to one cubic yard in bulk have been placed along the northern and eastern faces. To prevent these from being swept around the end of the work, materials were obtained in 1899-1900, for a block 70 by 40 feet, which in the years 1901-03 was built at the westerly end of the 'L.' This block consists of close-faced cribwork covered with 6-inch plank, the corners are protected each with three iron straps. Its total height is 17½ feet.

In 1903-04, a new break 223 feet long was built along the northern face of the 'L.' It is formed of cribwork 6 to 6½ feet wide, faced on the outside with four tiers of 10 by 12 timber laid close and covered with 4-inch plank. Tramway rails were laid along it, the turn table at the north-east corner was raised and the rails along the eastern face of the approach graded to the new height, by means of extra ties over a length of 120 feet. A ramp was also built on the western end of the 'L,' to enable teams to ascend to the new pier-head.

During 1904-05, 625½ cubic yards of granite boulders and 300 cubic yards of freestone blocks were obtained, with which the laid stone slope on the eastern face was continued a distance of 205 feet, or to within 3 feet of the north-east corner. Part of the stone was also used to repair the shore section previously built of freestone, and part was placed along the northern face of the 'L' chiefly in the angle between the 'L' and the new block. An extra cap timber was laid around the new block and along the outer face of the 'L', where also twenty-two new fenders were placed to secure it.

The expenditure for the year was \$2,499.23.

The total expenditure to June 30, 1905, is \$295,575.13.

## TYNEMOUTH CREEK.

Tynemouth Creek, St. John county, twenty-one miles east of the city of St. John, is one of the several small havens, dry at low water, found on both shores of the Bay of Fundy, which are only useful on account of the high range of tide. Tides rise here about 28 feet. Inside a beach of gravel and stones, is a tidal basin, accessible to small vessels at high water by an opening at the east end of the beach.

In 1874-75, the department built a substantial cribwork pier on the rocky fore-shore of the eastern cliff to prevent vessels from taking ground on that side.

In 1882-83, another work to maintain the channel was built on the point of the beach on the opposite side.

In 1894-95, a sum of \$225 was applied to replacing some of the fenders and covering of the east pier and to removing part of the rocky ledge obstructing the channel.

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In 1897-98, a sum of \$510 was expended in removing 313 cubic yards of shingle from a shoal obstructing the entrance, and in effecting minor repairs to the west pier.

The harbour is constituted by a long beach stretching from the western side of the inlet. By heavy gales, the crest of the beach was cut down almost 5 feet for a length of 300 feet.

In 1900-01, to prevent this beach from being lowered and the harbour from being endangered, a protection work of piles and planks, from which three groynes 41 feet long, projected, was built for a length of 345 feet.

At the cribwork groyne of the west pier, a block 68 feet long over all, and 16 feet wide, repairs were made for a length of 52 feet long, new ballast floors were inserted; new ballast was placed in the work; and the top was given new stringers, and in great part, new covering, besides ten new fenders. The remainder of the covering of the west pier was also patched in places.

At the east pier, chocks were inserted between started face-timbers to retain the ballast; 13 new fenders were placed and the break was repaired.

During the fiscal year 1903-04, the main body of the west pier was raised 2 feet for a length of 116 feet, ballasted for a depth of 5 feet and newly covered. The spur of the west pier was also raised two tiers, ballasted and covered; while the inner end was levelled up and raised one tier. Three new fenders were added to the east pier, and loose fenders were bolted. The road approaching this pier was also repaired for a distance of about 50 yards. The shoal obstructing the entrance to the harbour was removed, the channel being made 45 feet wider, and 2 feet deeper than before by removing the bar for a maximum length of about 300 feet.

In 1904-05 general repairs were made principally to the west pier, a part of which was raised 5 feet, ballasted, covered and fendered. At low water the channel which curved sharply, was straightened, and the shingle banks were protected with brush and stone. Large stones were also removed from the beach and the channel was much improved.

The expenditure during the fiscal year 1904-05, was \$499.80.

The total expenditure to June 30, 1905, is \$9,741.37.

#### UPPER SALMON RIVER.

Upper Salmon river, otherwise called Alma, the terminus of the Albert Southern railway, is situated in the county of Albert, 5 miles from Rocher bay, and 2 miles from Herring Cove.

From Alma, deals are either sent in coasting vessels to St. John for shipment, or are transported directly to sea-going vessels lying at the anchorage of Grindstone Island, or in the roadstead of Herring Cove. For protection of the coasters lying inside the river-mouth at the private wharfs, which afford 4 or 5 berths, the department built in 1883-84 a breakwater 26 feet in mean width and 180 feet long.

In 1886-87 this breakwater was extended to a total length of 420 feet. By position the work lies across the path of the littoral drift. In consequence, the foreshore has advanced nearly 500 feet on the weather side, and the drift, having fully charged the outside of the breakwater, is now working around the end. Accordingly, inside the point of the breakwater a bar 11 feet in height was formed which extended nearly across the mouth of the river. By means of a temporary groyne, inducing scour, the channel, which had become contracted to a width of only 34 feet was increased during the months of April and May 1900, to 125 feet in breadth, but the shoal was soon formed again.

On August 6, 1902, a contract was let for the construction of an extension 104 feet in mean length, and 30 feet wide on top, of close faced cribwork, with a sloping face on the weather side of the breakwater. By the end of the year, excavation for the foundation had been made and the timber work begun.

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By the end of the year 1903-04, the work had been brought up to the 23rd tier or 4 feet below the level of the finished top. In August, 1904, the work was completed.

The expenditure during the fiscal year, 1904-05, was \$1,766.50.

The total expenditure to June 30, 1905, is \$16,596.20.

## UPSALQUITCH RIVER

The Upsalquitch river is the largest tributary of the Restigouche river from the south, and drains about one third of Restigouche county. It enters the Restigouche river about 6 miles above Matepédia station, on the Intercolonial railway. It is an important lumbering river, about 15 million feet of logs being driven down it annually and 15 lumber camps are situated on the river and its branches.

Improvements were asked to facilitate log driving and the passage of towboats, which carry about 100 loads of supplies to the camps each season. The work was done during August and September, 1904, and was as follows: Removing a gravel bar at foot of Little Falls; blasting the tops off or making channels through 12 ledges and blasting 7 boulders; removing also 75 smaller rocks, all at Little Falls. At Reid's rapids, blasting one ledge and about 20 boulders; McGowan's rapids, blasting about 50 boulders; Rocky rapids, clearing the channel for a length of 300 feet of boulders, about 150 being removed; Big Falls, cutting a road for horses through two edges, at the side of the falls and blasting the tops off six ledges in the channel. These improvements were made in the lower 12 miles of the river, where navigation is most difficult.

The expenditure for the fiscal year was \$470.54.

## WILSON BEACH.

At Wilson's Beach, a fishing settlement in a slight indentation of the coast on the west side of Campobello, an island in the Bay of Fundy, forming a part of the county of Charlotte, a breakwater 373 feet in length was built to shelter the cove by the joint contributions of the federal and local governments between the years 1874 and 1878.

The outer arm of the breakwater having become dilapidated and the cove, having been silted up, preparations were made in 1899-1900 to restore the inner end 284 feet in length, and the repairs were nearly completed in the following year, 1900-01. A quantity of materials was also procured for the construction in deeper water of the dismantled outer end.

In 1901-02, the repairs to the inner end were completed. Crib No. 1 of the part to be reconstructed, 80 feet in mean length, and 36 feet wide, consisting principally of hardwood timber, was built, placed in position and ballasted. Crib No. 2, 74 x 40 made of similar materials, was also begun and at the end of June had been built to a height of eight tiers. A quantity of timber was also delivered.

In the fiscal year 1902-03, crib No. 1, was increased 130 feet in length on the outside and raised at the inner end to the 26th and at the outer, to the 23rd tier. Crib No. 2 was brought up to 23rd tier.

In 1903-04 the superstructure of crib No. 1 was completed; while the top of crib No. 2 was brought up to the full height, with the exception of the benching required to be left for making the connection with crib No. 3 which was begun and brought up to the tenth tier in height.

By the end of 1904-05, crib No. 3 had been built, sunk in place, brought up to the height of the third floor, and ballasted, and the work had been covered to within 85 feet of the end.

The expenditure during the fiscal year 1904-05 was \$1,800.

The total expenditure to June 30, 1905 is \$40,533.81.



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## PROVINCE OF QUEBEC.

## ANSE À BEAUFILS.

Anse à Beaufils, in the municipality of Cape Cove, County of Gaspé, is situated on the Gulf of St. Lawrence, six miles south of Percé.

In the years 1898 to 1901, protection works, on each side of the channel leading to the inner basin, were built, consisting of two training piers, each about 440 feet long.

During the fiscal year 1902-03, the pier on the eastern side having settled in the sand 6 to 8 feet deep, the sum of \$467.12 was expended in partly levelling the depressed portion.

During the month of October and November last, 50 feet of the east training pier, having been broken into by the sea, had to be sheathed with small logs, and part of the ballast carried away was replaced. A crib of 85 x 22 x 12 feet was built as an extension to the west training pier. The work was done by day labour.

The total expenditure during the last fiscal year amounted to \$1,548.48.

Spring tides rise 5 feet; neaps 3 feet.

## ANSE À BENJAMIN.

L'Anse à Benjamin, at St. Alphonse, is situated on the west side of Ha, Ha bay, on river Saguenay, in the County of Chicoutimi, near the wharf of St. Alphonse.

The work done consists in the blasting and removal of boulders.

Expenditure, \$901.97.

## ANSE À GILES.

L'Anse à Giles is situated on the south shore of the St. Lawrence, about four and a half miles west of the village of L'Islet.

In the year 1904, this department acquired a wharf at that place; it consisted of a head block, 50 by 36 feet and 16 feet high, together with six platforms connecting piers; the total length, 357 feet.

During the fiscal year 1904-05, the following repairs were made to that pier; two piers, 25 by 20 feet and 15 feet high, were entirely renewed, the superstructure of the others was rebuilt and all the corners protected with spruce sheathing 4 inches thick; all the stringers were replaced and the whole flooring and cap timbers renewed.

The wharf is now in a fair condition but additional works will be required to complete repairs.

The expenditure amounted to \$987.94.

## ANSE À LA GROSSE ROCHE.

L'Anse à la Grosse Roche, in the parish of Sacré Cœur, in Chicoutimi county, is situated on the north side of the River Saguenay, twelve miles from its mouth.

During the year 1903-04, a certain quantity of timber was bought in view of the construction of a wharf at this place.

Amount expended, \$599.50.

During the fiscal year 1904-05, a contract was awarded for the construction of the wharf, for the sum of \$9,000; work was commenced at once.

When completed, the wharf will be 265 feet long, and the depth of water, at the outer end, will be 16 feet, at low water spring tides. It will consist of three piers, placed 20 feet apart; the outer pier, built in the form of an 'L,' will be 105 feet long and 40 feet wide. The abutment will be 90 feet long and 20 feet wide.

The expenditure during 1904-05, was \$8,538.82.



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## ANSE À L'ISLOT.

Anse à L'Islet is a small harbour seven miles west of Newport, protected from the northerly and easterly winds by the main coast, and from the south-west gales by a small island, being thus open only to southerly gales.

It was decided to build a landing pier, running from the main shore towards the outside end of the island, in a south-westerly direction answering both the purposes of a landing pier and of a breakwater.

During the latter part of the last fiscal year, timber was bought for the proposed work to the amount of \$397.20.

## ANSE AU GRIFFON.

Anse au Griffon is seventeen miles north-west of Gaspé cape. The mouth of the river, having been choked and closed up by a gravel bar thrown in by north-easterly gales, overflowed the flats and part of the village, causing a good deal of damage to property and to the fishing industry.

The new channel running easterly, inside of the gravel bar, had to be closed by a training pier 345 feet long, 11 feet high and 22 feet wide, with brush and stone backing.

The gravel bar, 10 to 12 feet high and 170 wide, had to be cut through for the continuation of the training pier. A channel of 600 feet long was opened at some distance above the work, so as to take the water from a small tributary into the main river, above the works under construction.

The expenditure during the fiscal year of 1904-05, is \$1,603.26.

## ANSE AUX GASCONS.

The village of Anse-aux-Gascons, Bonaventure county, is situated on the north shore of the Baie des Chaleurs, in the municipality of Port Daniel east, 7 miles from Port Daniel, 42 miles from Percé. It is one of the best fishing stations on the Baie des Chaleurs.

In 1897, a contract was entered into for the construction of a breakwater, in the sum of \$11,494; work was completed in 1899.

This structure is 436 feet long and 20 feet wide on top, built of close face crib-work and sheathed.

During the fiscal year 1901, the sum of \$1,402.49 was expended in repairs, improvements and in the removing of dangerous boulders from the vicinity of the breakwater.

On April 27, 1904, a contract was entered into for the construction of an addition 210 feet long, 30 feet wide, built of close faced cribwork, filled with stone and covered with 6-inch flooring. Contract price, \$15,495.

During the last fiscal year, the extension, on its entire length of 210 feet, was built up to about 1 foot from high water level.

The expenditure during 1904-05, amounted to \$11,612.50.

## ANSE ST. JEAN.

Anse St. Jean is situated on the north shore of River Saguenay, 25 miles above its mouth.

The public landing was commenced by the local government in 1876, and was continued by the federal government in the years of 1879-80 and 1880-81.

The amount expended by the local government and the municipality is \$1,700.

During the year 1881-82, the upper part of the pier was completed at the cost of \$1,091.72. The pier then was 356 feet in length, 26 in width up to the head which is

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50 by 40 and 30 feet high. At low water spring tides, there is a depth of  $7\frac{1}{2}$  feet at the outer end of the pier.

In 1884-85, the pier was repaired at a cost of \$94.25.

During the year 1886-87, the sum of \$865.28 was expended on the construction of a movable slip for building an open shed, 40 x 28 feet, and renewing part of the flooring.

In 1890-91, a portion of the wharf, which had settled in the spring of 1889, was raised from  $2\frac{1}{2}$  to 3 feet over a length of 135 feet; the flooring was renewed, a quantity of stone was placed in the eastern portion of the wharf and the shed was repaired.

Expenditure, \$999.42.

During the years 1892 to 1897, repairs were made, the flooring completed, and the eastern face of the cribwork sheathed at the cost of \$1,963.75.

During the year 1898-99, a landing slip was built on the eastern side of the pier; it is 75 feet long at the base, 25 feet on the top and 14 wide and filled with stone ballast. The planking of the pier was renewed on a length of 200 feet. Total expenditure, \$1,000.27.

In the year 1899-1900, 50 feet of the outer end of the wharf was sheathed, 300 feet of flooring was completed with 3-inch spruce deals and the shed was painted. Expenditure, \$1,010.15.

During the year 1902-03, the work done consisted of general repairs to the flooring, a new landing slip and the sheathing of the shed.

Amount of expenditure, \$747.91.

During the year 1903-04, a pier, 24 feet in length by 50 feet in width, 34 feet in height was sunk in 13 feet of water, at low water spring tides. This pier is built of round logs open face cribwork, fenders every 8 feet, and sheathed on the two outside corners with 8-inch timber. Expenditure, \$3,059.84.

During the fiscal year 1904-05, the pier, commenced the previous year, was completed; the work consisted in laying the stringers, planking and sheathing. Repairs were also made to the wharf.

Spring tides rise 17 feet, neaps 10 feet.

The expenditure during 1904-05, was \$1,191.99.

#### BAIE DES ROCHERS.

Baie des Rochers is a small village in the County of Charlevoix, situated on the north shore of the St. Lawrence, 120 miles below Quebec.

In order to provide accommodation for the lumber traffic of that place, the construction of a small wharf was commenced during the summer 1904.

At the end of the fiscal year this construction was only half completed.

#### BAIE ST. PAUL.

The village of Baie St. Paul is in the County of Charlevoix, its population is about 1,500. It is situated on the north shore of the St. Lawrence, sixty miles below Quebec.

This village is built on both sides of the Riviere au Gouffre, which is a tributary of the St. Lawrence, and empties in a large bay three miles wide.

During the fiscal year 1904-05, soundings were taken in view of locating and removing certain quantities of boulders dangerous to steamers calling to that place.

The face-timber and hardwood sheathing, broken by the ice during the last winter, were replaced; 25 toise of stone ballast that had fallen alongside the wharf were placed back into the crib; lifeguards were placed on a length of 150 feet, and 350 planks of the flooring were renewed.

The expenditure for the fiscal year 1904-05 amounts to \$1,789.77.

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## BARACHOIS DE MALBAIE.

Barachois de Malbaie, Gaspé county, is a large parish and municipality, situated at the head of Malbaie, some twelve miles east of Percé, the shiretown.

Barachois, on account of the large area of rich farming lands situated along the four rivers that form the barachois, of the important lumber firms that have built their mills along the barachois, and of its first-class fishing harbour, now that the government has started a training pier to improve the entrance, may be considered the most promising centre in Gaspé peninsula.

Until the government started the training pier now under construction, the fishing boats could not safely enter or go out of the harbour at falling tide and at low tide, on account of shifting sand bars, they had to remain outside and wait for the rising tide to come in. Many a good day's fishing was lost thereby, many a sad accident happened and even lives were lost.

During the last fiscal year a crib 100 x 22 x 18 was partly built and placed in position, at 590 feet from extreme high water mark; the approach thereto, from said high water mark was built of fascine mattresses, with brush and stone filling. Two-thirds of the work undertaken was completed by June 30, 1905.

The total expenditure during 1904-05 was \$4,264.41.

## BASSIN.

The Bassin is a large parish at the center and west end of Amherst island.

The population is composed of Acadian fishermen engaged mostly in cod-fishing. On the south shore of Amherst island, opposite the said fishing establishment, there is no shelter whatever. It was decided to construct a small breakwater.

A crib, 66 feet long and 25 feet wide, was built to a height of 13 feet, and left to settle.

The total expenditure during the last fiscal year is \$3,890.98.

Spring tides rise 4 feet; neap, 2 feet.

## BELCÉIL.

Belcél is an incorporated village in Verchères county, on the north side of the Richelieu river, and on the Grand Trunk railway, twenty-one miles north-east of Montreal.

It has an express office, one store, two hotels, one saw-mill, and the works of the Hamilton Powder Company. Population, 400.

The Richelieu river leaves Lake Champlain at its northern extremity, and after a course of eighty miles enters the St. Lawrence at Sorel. It is broader and more rapid in the former than the latter part of its course, and at its centre it expands into the Basin of Chambly. The Richelieu forms the most important medium of traffic between the St. Lawrence and the Hudson river.

South of the Grand Trunk railway bridge, which crosses the river at Belcél, the government built a number of piers and booms on both sides of the channel, to facilitate the passage of steamers and barges coming down the rapid current of the river and going through the narrow passage of the draw-bridge. There were eight piers, four on each side of the channel, distant from 80 to 100 feet from one another. From 1885 until 1888, some slight repairs were made to the booms at a cost of \$353.43. In 1890-91, three of the piers were rebuilt from the water line and some slight repairs were made to the booms at a cost of \$1,500.35. In 1891-92, two other piers were rebuilt from the water line at a cost of \$1,193.38. In 1895-96, some slight repairs were made to the booms at a cost of \$144.79.

In 1896-97, it was found that the guide piers on the west side of the river, were in such bad condition that they could not be properly repaired, and an entirely new

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line of guide works was adopted. It was decided to build a solid cribwork wall from the Grand Trunk railway pile abutment upward, following the line of a  $15^{\circ}$  curve (about the natural curve of the shore) for a distance of 337 feet, to remove the four old piers and booms, and to dredge a wider channel for the free passage of boats.

The work carried out by day labour, was commenced during that fiscal year and completed in 1899-1900, at a cost of \$17,444.67, including the dredging.

In 1903-04, the top of the four guard piers, on the east side of the river, were renewed to a height of four to six feet, and sheathed with hemlock six inches thick.

The work carried out by day labour was not completed on June 30, 1904, the sum of \$1,673.34 being expended.

The repairs were continued in October of the present fiscal year and completed at the end of November last. They consisted chiefly in the replacing of three to five tiers of the top timbers of the four piers, the inserting of screw bolted vertical posts at all corners; the sheathing of the two upstream faces of each pier and icebreaker with 6-inch and 8-inch timber, respectively, and the renewing of the two top tiers of long pier with 12 by 12-inch timber. The piers are now in good condition but the guide booms are old and will probably have to be rebuilt next year. The repairs were made by day labour at a cost of \$510.68.

## BERTHIER, EN BAS.

The village of Berthier, in the County of Montmagny, is on the north shore of the St. Lawrence, 24 miles below Quebec. A large traffic in farm produce is made through the coasting steamer *Champion* which calls at the wharf.

Spring tides rise 21 feet, neaps 13 feet.

During the fiscal year ended June 30, 1905, the following works were performed at Berthier wharf: the addition to the wharf built some years ago, having settled, was raised about 9 inches and made level with the old wharf. In the month of May 1904, during a heavy storm, the shed standing upon the outer end of the wharf, was severely damaged by the waves; it has been thoroughly repaired and strengthened with knee braces. A surface of 1,500 square feet, of the face timber, on the east side, was sheathed with tamarack deals 3 inches thick.

The expenditure during the fiscal year, was \$791.04.

## BOIS BRULÉ.

Bois Brûlé is a small fishing cove some five miles below or south of Douglastown. As the beach for the landing of the boats was wearing away, it was decided to construct a training pier.

A crib, 90 x 22 x 12 feet was first built to an old crib, part of which formed the abutment of the bridge crossing the Bois Brûlé river. The old crib was found to be so badly decayed and the bridge so unsafe, that they had to be demolished and rebuilt.

The expenditure during the last fiscal year is \$1,161.02.

## BONAVENTURE.

Bonaventure East, an important settlement in Bonaventure county, is situated on the Baie des Chaleurs, 10 miles south of New Carlisle, the shiretown of the county. It is a station on the line of the Atlantic and Lake Superior railway. Population of the parish about 2,500.

During the fiscal year 1903-04, a contract was entered into for the construction of a breakwater at this place, in the sum of \$15,690.

The work consisted of a cribwork abutment 20 x 20 feet; five cribwork blocks 20 x 20 feet, and an outer block 460 feet. This latter block to be formed of four separate cribs, 150, 150, 9 and 70 feet respectively. The whole structure to be 20 feet

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wide, and the landing slip 70 feet long. The top of the flooring to be 12 feet 5 inches above low water spring tides.

Spring tides rise 7 feet.

The works under contract were completed during the fiscal year 1904-05, and the approaches to the breakwater were built by day labour.

The total expenditure during the last fiscal year is \$12,722.50.

## BROMPTONVILLE.

Bromptonville is a post village in Richmond county, on River St. Francis, and on the Grand Trunk railway, 6 miles from Sherbrooke.

The crib protection wall built at this place was recommended so as to protect, from the bridge to the river bank, the earth roadway which during the spring freshets is broken by ice, undermined by the water and carried away.

The work consists in two open-faced cribs each 100 feet long, 10 feet wide and standing in an average of 10 feet of water, fully ballasted with stone and sheathed with 4-inch planks. The work was done by day labour and completed in the middle of November last. Last spring, it gave adequate protection.

Expenditure during fiscal year, \$1,970.59.

## CACOUNA.

Cacouna, one of the best known and most frequented summer resorts in Canada, is an important village in the County of Temiscouata, on the south shore of the St. Lawrence, one hundred and twenty miles east of Quebec.

Spring tides rise 20 feet; neap tides, 18 feet.

In the course of the past fiscal year, the sum of \$1,249.29 was expended in doing repairs to the wharf.

The section constructed many years ago, some three hundred feet in length, had settled unevenly and was leaning on the east side, in some places the difference in elevation being  $1\frac{1}{2}$  feet, the superstructure was unbuilt and raised to the level of the new section.

The handrails, blown down during a heavy storm, upon a length of 500 feet were renewed, also most of the cap timbers.

To complete the extension built last year, the outer face and angles were sheathed with hardwood 6 inches thick, and the corners secured with iron straps.

A stairway was also built on the east side of the addition.

## CANNES DE ROCHES.

Cannes de Roches is a small fishing cove situated at the foot of the Percé Mountains, the only harbour for the fishermen from the mountains and from the settlement of Corner of the Beach, on the west side of Malbaie bay.

During the last fiscal year, a sum of \$999.66 was spent towards making preparations and buying the material necessary to build a small breakwater, to protect the cove from the easterly winds.

## CAPE COVE (ANSE DU CAP).

Cape Cove, Gaspé county, is an important fishing station on the coast of Gaspé, some nine miles south of Percé, the shire town. It is a port of call for steamers plying between Montreal and Pictou and between Dalhousie and Gaspé basin.

During the last fiscal year, timber was purchased towards the construction of a landing pier at that place.

The expenditure during 1904-05, was \$2,111.04.

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## CAPLAN.

St. Charles de Caplan, Bonaventure county, is situated on the Baie des Chaleurs, between Bonaventure and New Richmond.

Its population, about 1,500, is mostly composed of farmers. It is a station on the Atlantic and Lake Superior Railway, some sixty-seven miles from Metapédia.

On May 31, 1904, a contract was entered into for the construction of a breakwater, in the sum of \$13,700. Work was completed during the fiscal year of 1904-05.

The breakwater, as completed, measures 400 feet in length by 20 feet in width, and is built of square timber close-face cribwork. The shore end is 85 feet long; the next two cribs 100 feet each, and the outer crib 115 feet long; the superstructure is of continuous cribwork for the full length of 400 feet.

The approaches to the breakwater and road leading thereto were built by day labour.

The expenditure during the last fiscal year is \$11,510.40.

## CAP SANTÉ.

Cap Santé, the chief town of the county of Portneuf, is situated on the north shore of the St. Lawrence, five miles below Portneuf and thirty-one miles above Quebec.

Spring tides rise  $14\frac{1}{2}$  feet, neap tides,  $8\frac{1}{2}$  feet.

During the last fiscal year, 1904-05, the landing was raised and repaired.

The works executed comprised the raising of the new extension block built in 1900-01, on an average of  $2\frac{1}{2}$  feet in front, on an area of 69 x 52 feet of woodwork, taking some 3,500 feet of square and round timber and 9,600 feet of 3-inch pine deal planking, besides about 5,000 feet of 6-inch cedar sheathing.

The west slope, or ice-breaker, had also to be raised on a level with wharf, its full length of 155 feet, sheathed with 6-inch hardwood where needed, and protected with  $\frac{5}{8}$ -inch steel plate, 8,070 lb. being used.

The rear part, forming an area of 102 x 80 feet, was also raised on an average of 20 inches deep with stone and gravel; the combined freight and waiting-room had to be removed, strengthened and replaced on wharf permanently.

To prevent frequent washouts in heavy rains down the hill to government road leading to level of wharf, it was found expedient to build a protection wall of dry stone, 72 feet in length, mean height  $3\frac{1}{2}$  feet and average width 2 feet, with earth filling in rear.

The expenditure during 1904-05, amounted to \$2,498.89.

## CHAMBORD.

Chambord, in the County of Chicoutimi, is situated on the north-east side of Lake St. John, 12 miles east of Roberval.

Chambord is the junction for the Quebec and Lake St. John railway of the Roberval and Chicoutimi branches. It is an important village and contains one Catholic church, post office, several stores, telegraph office, several cheese factories and a saw-mill.

During the year 1903-04, a certain quantity of timber was purchased in view of the construction of a wharf at that place. Amount expended \$1,304.92.

During the fiscal year 1904-05, a contract was entered into for the construction of a wharf for the sum of \$9,250.

The work done consists of 7 piers, 25 x 20 feet, a head block 30 x 50 feet and an abutment of 40 x 20 feet. The whole is completed.

The depth of water at the outer end is 7 feet. The water rises in spring 14 feet. The total expenditure during fiscal year 1904-05, is \$5,066.67.



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## CHAMPLAIN.

Champlain, a post village in Champlain county, situated on the north shore of the River St. Lawrence, and on the C.P.R., 15 miles east of Three Rivers. It contains a Roman Catholic church, 2 telegraph offices, 9 stores, 2 hotels, 1 saw-mill, 1 butter factory, &c. Distance from station to village,  $1\frac{1}{2}$  miles. Population of the village, 2,000.

With a view of affording much needed waterway facilities to the traffic of Champlain and surrounding localities, it was decided to build a public wharf at that place.

In May 1904, the old wharf of Mr. H. Arcand, with a piece of land of about  $\frac{1}{2}$  an arpent in area, on the shore of the river, and a right of way from the public road to the wharf, was purchased for the sum of \$1,000. On June 30, material had been procured for the sum of \$4,628.07.

During the present fiscal year, the wooden substructure, a length of 110 feet and a width of 30 feet, was built to a height of 2 feet above extreme low water level, sunk in front of the old Arcand wharf and fully ballasted with stone. This was completed in September.

The superstructure of the same dimensions as crib at bottom, but  $98\frac{1}{2}$  feet by 30 feet at top on account of icebreaker, and 9 feet high, shall be of concrete mixed 1:2:4 and composed of 12 x 12-inch members, with two  $\frac{1}{2}$  inch and two  $\frac{3}{4}$  inch iron bars inserted 3 inches from outside and inside faces, respectively. These members shall be held together by  $1\frac{1}{2}$ -inch iron bars  $10\frac{1}{2}$  feet long and laid vertically. A slip 9 feet wide, 11 feet long and starting 5 feet above low water shall be made in the middle of the face. The concrete icebreaker, inclined  $1\frac{1}{2}$  in 1, shall be monolithic and mixed 1:3:5. The filling of the head block shall be of stone and sand.

During the autumn and spring 1904-05, 165 concrete members out of the 230 needed, of different forms and lengths varying from 2 feet to  $22\frac{1}{2}$  feet, and representing a total lineal length of 1839 feet out of the 3,027 feet required, were moulded, but owing to high water, these have not yet been put in place. They are expected to be assembled as soon as the water recedes, some time in July next.

The stone approach for a length of 150 feet, a width of 21 feet at top with slopes of  $1\frac{1}{2}$  in 1, covered with an 8-inch coat of concrete mixed 1:2:5, on the upstream side, and 5 in 8 on the other side, is about  $\frac{3}{4}$  completed. The work was done by day labour at a total cost of \$8,163.62.

## CHATEAU-RICHER.

Chateau-Richer is a village situated fifteen miles below Quebec, on the north shore of the River St. Lawrence.

To accommodate the traffic of this place, a timber wharf was commenced during the last fiscal year; at the end of the year, one-half of the construction was completed. A certain amount of money was also expended towards removing a chain of boulders.

The expenditure for the fiscal year amounts to \$7,160.86.

## CHICOUTIMI.

Chicoutimi, the town of Chicoutimi, in the county of the same name, is situated on the south shore of Saguenay river, seventy-one miles above Tadousac, and at the head of navigation. The Richelieu and Ontario Navigation Company's boats call two to six times a week at the Chicoutimi pier, during the season of navigation, with passengers, freight and mail.

At the mouth of the river Chicoutimi, about one mile from the government wharf, there is an extensive lumbering establishment belonging to the Messrs. Price



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Bros. & Co., who export large quantities of sawed lumber, laths, shingles, &c., to Europe and elsewhere, in ocean vessels and large schooners which ascend the Saguenay to the town.

There is also the Chicoutimi Pulp Company, who has two pulp mills of a capacity of 78,000 tons a year; the Chicoutimi Pulp Company, loads every year an average of twenty steamers.

Construction—The landing pier was commenced in the year 1873, by the St. Lawrence Tow Boat Company and completed by the Dominion government, to whom it was handed over in 1874, at a cost of \$14,193.40. From 1874 to 1882, inclusively, it was extended and improved at a total cost of \$2,823.73. The pier was then 282 feet long, and consisted of an approach 248 feet long and 30 feet wide, and of a head block 34 feet long and 127 feet wide, forming two wings, respectively, 70 feet and 27 feet wide. On the upper or 70 foot wing was a combined waiting room and office, 20 feet square.

The depth of water at the end of the pier, which was originally 10 feet at low water spring tides, was then reduced to 7 feet by the accumulation of slabs and sawdust from the mills, at the mouth of the Chicoutimi river.

In 1883, the shore end portion of the approach on a length of 38 feet, was embedded in an embankment upon which the station and shed of the Chicoutimi branch of the Lake St. John railway are now erected.

The length of the approach was thereby reduced to 210 feet. In 1884, the approach was widened 70 feet by filling in with slabs the whole space, 210 feet in length, between the upper or 70 foot wing and the shore, and a storehouse 40 feet long and 24 feet wide was erected on this extension at a total cost of \$2,145.84. The filling was not, however, carried up to the level of the top of the pier until 1885, when the extension was floored in a manner similar to the rest of the work. A separate waiting-room was also erected on the lower or 27-foot wing. The amount expended was \$2,042.11.

In 1890, a cribwork retaining wall, 14 feet wide, was commenced along the slab filling built in 1884, and the flooring was repaired where required at a total cost of \$1,005.81.

In 1891, the cribwork retaining wall was completed; a shed 28 x 29 feet built at the southern end of the pier, and the flooring repaired at various places at a cost of \$1,802.70.

In 1897, the pier was again widened by the addition of cribwork, 30 feet wide along its lower eastern face, from the lower or 27-foot wing to shore, a distance of 210 feet. The cribwork was fully ballasted and floored with 3-inch tamarack plank, and twenty-five fenders were placed along its face. The pier was also sheathed for a length of 50 feet, along its northern face, in order to complete the sheathing all around the work. The expenditure was \$4,992.96.

As then completed the pier was 245 feet long and 130 feet wide. It was 29 feet high above the bottom of the river, at its outer end, which stands in about 8 feet of water at low water spring tides.

Repairs—In 1883 and 1886, minor repairs were done to the flooring, &c., &c., at a cost of \$288.55.

In 1887, a slip was built at the outer end of the pier, the waiting-room was painted and general repairs performed at a cost of \$1,390.34.

In 1889, the flooring of the pier was almost entirely renewed and six fenders 14 inches square, were placed along its outer face at a total cost of \$1,631.65.

In 1892 and 1893, the flooring of the pier was completely renewed on a length of 210 feet and a width of 110 feet, with red spruce plank 5 inches in thickness; the east side of the structure was raised 18 inches; the waiting-room was painted both sides and outside, and two mooring posts were renewed. The expenditure during the two years amounted to \$3,024.04.

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In 1894, a sum of \$1,999.60 was expended for the construction of a movable slip, and the purchase of two crab-winches to raise it. During the years 1895-96, a portion of the outer face and the whole of the eastern face of the structure were re-sheathed with red spruce 6 inches in thickness; a portion of the flooring, not completed in 1893, was laid.

Expenditure during the two years, \$3,991.88.

During the year 1898, a sum of \$239.79 was expended on minor repairs to the flooring, sheds and waiting room.

During the year 1899, a freight shed, 60 by 30 feet, was constructed on the south side of the pier, for the storage of butter and cheese. Part of the top planking was renewed. The work was done by day labour, at a cost of \$1,499.27.

During the year of 1900, the pier was raised 3 to 5 feet over the whole surface, stone ballast was placed in the outer pier, which was all sheathed with tamarack and the covering was renewed with 3-inch plank.

Total expenditure, \$5,050.59.

During the year 1900-01, a new 3-inch tamarack floor was laid on a length of 310 feet and a width of 45 feet.

The northern part of the wharf for a length of 145 feet was sheathed and the sheds painted.

Expenditure, \$1,012.12.

During the year of 1901-02, the old building on the wharf was taken down and new ones erected; the new freight shed measured 60 by 30 feet, the passengers waiting room is 25 by 25 feet; those two buildings are covered with galvanized iron and painted three coats, inside and outside.

On the north side of the wharf, six fenders, 11 by 11 inches were placed and five snubbing posts renewed. Total expenditure, \$1,513.34.

During the year 1903-04, the two outer corners of the wharf were renewed with hardwood, new fenders were put in at the head of the wharf, the flooring was repaired, and a portion of the flooring on the shore end which had to be renewed was replaced with gravel; other minor repairs were also made. Amount expended, \$903.72.

During the fiscal year 1904-05, boulders on the east side of the wharf were blasted and removed. Amount expended, \$365.64.

Spring tides rise 17 feet; neaps, 9 feet.

## CHUTE MONTE À PEINE.

Chute Monte à Peine is a settlement in Joliette county, on River L'Assomption, some three miles from St. Jean de Matha, eleven miles from St. Felix de Valois on the Canadian Pacific Railway.

The wharf at this place being totally decayed, an expenditure of \$1,000 was authorized this year for repairs. This structure was entirely rebuilt and now stands 110 feet long by 13 feet wide, and 10 feet high. The top and the upstream face have been sheathed with 3-inch planks; steel plates,  $\frac{1}{2}$ -inch thick and 5 feet wide, have been secured to the front sheathing and bent 1 foot on top, in order to protect the work against the action of the ice and logs. The wharf is now in fair condition.

These repairs were carried on by day labour at a cost of \$999.99.

## CLARKE CITY WHARF (SEVEN ISLANDS).

Clarke City is situated at the Bay of Seven Islands, Saguenay county, on the north shore of the Gulf of St. Lawrence, about 300 miles below Quebec.

The wharf is being built at a point called Pointe Noire, which is situated on the south shore of the bay; from there a railway line, 9 miles long, has been built to the falls of Ste. Marguerite river, where the North Shore Power Railway and Navigation

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Company are constructing a dam and erecting a pulp mill of proposed initial capacity of 250 shipping tons, and final capacity of 500 shipping tons of pulp per day. This pulp will be carried on the railway from the mill to the wharf and there transferred on steamers.

During the session of parliament of 1903, the sum of \$25,000 was voted towards the construction of a wharf at Pointe Noire, and during the session of 1904, a further sum of \$60,000 was voted to buy from the North Shore Power Railway and Navigation Company the part of the wharf built by them, for the sum of \$34,433.95, and a certain quantity of timber and iron to the value of \$21,485.34 and to complete the work already begun.

By Order in Council, March 1, 1904, the transfer by the company was accepted, and agreement was entered into with the company, for the performance of the balance of the work required.

The work already done in 1903, by the North Shore Power Railway and Navigation Company and as bought by the department, consisted of a stone approach 575 feet long and one crib 200 x 30, sunk and built to ordinary low tide level.

Work was resumed on May 21, 1904, and continued till October 27, 1904, when two cribs, 200 feet long by 30 feet wide respectively had been sunk in place, the superstructure of these two cribs and of the other one sunk the year before, was built to 2 feet below the required elevation and the cribs were partly filled with ballast.

Spring tides rise 12 feet, neaps 5 feet.

Total expenditure during fiscal year 1904-05, \$49,881.92.

#### COTEAU DU LAC.

The village of Coteau du Lac, in the County of Soulanges, is situated on the north shore of the St. Lawrence, 36 miles above Montreal.

Construction.—In 1888, the construction of a landing pier was commenced and was completed in 1889, at a cost of \$6,918.71. It consists of a head block of solid cribwork, 101 feet long and 21 feet wide, with a cribwork extension, 40 feet long and 47 feet wide, built along the middle of its inner face, and a block and span approach 75 feet long and 26 feet wide. The outer face of the head block is 15 feet high above the bottom of the river, and stands in 10 feet of water at ordinary low water. Across the inner end of the extension to the head block, is built a freight shed of the full width of the extension and 20 feet long, with a passageway for vehicles underneath.

Repairs.—During the year 1894-95, sundry repairs were effected to the structure at a cost of \$249.99. In 1896-97 most of the floor stringers and the whole flooring of the pier, which were decayed, were removed, new floor stringers were put in, the whole structure was refloored with 4-inch hemlock planks at a cost of \$694.58.

In 1897-98, sundry repairs were made to the corner sheathing, capping, &c., at a cost of \$200.41.

In 1903-04, the head block being decayed and dilapidated, was removed to low water level, and rebuilt with close-faced 12 x 12-inch timber.

These repairs were not quite finished during that year, the sum of \$914.36 being expended.

During present fiscal year these were continued and completed at a cost of \$710.75.

The pier was transferred to the control of the Department of Marine and Fisheries on August 28, 1896.

#### COTEAU LANDING.

Coteau Landing is the chief town of the county of Soulanges, situated on the St. Lawrence river, 2 miles from Coteau and 36 miles south-west of Montreal.

Construction.—In 1871, a mooring block was built by the department at a distance of 876 feet 7 inches from shore.

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In February, 1872, a contract was entered into for enlargement of this block and for an approach to the shore, with a series of piers 8 x 12 feet and spans averaging 30 feet long. The head block was made 270 feet long and 24 feet 8 inches wide, with a 30 feet long icebreaker at its upstream end. The approach was built 876 feet 7 inches long and 12 feet wide, except for a length of 92 feet adjoining the head block, where it was made 24 feet wide. All the blocks are of openfaced cribwork filled with stone ballast. The head block stood 18 feet high in 12 feet of water.

Repairs.—Minor repairs were made to the pier in 1882 at a cost of \$8.

In 1886, the structure having been damaged by ice, repairs to the extent of \$1,544.12 were made.

From 1889 to 1892, all the cribs were pulled down to E.L.W.L. and rebuilt close faced, at a cost of \$9,664.33.

In 1897, the stringers were renewed and the whole of the approach, and a portion of the head block refloored with 4-inch hemlock planks at a cost of \$1,797.03.

During 1898, the outer face of the head block was resheathed with 6-inch hemlock at a cost of \$314.20.

In May and June, 1902, the eastern half of the outer block was rebuilt from low water level and refloored with 4-inch hemlock planks, some stringers and the flooring of the approach were renewed, the roof of the storehouse covered with corrugated galvanized iron and other minor repairs made at a cost of \$1,097.72.

In order to insure more permanency to the work, extensive repairs to the approach were undertaken and completed during the last fiscal year. The 25 cribs of this approach were pulled down to 1 foot above E.L.W.L., and concrete piers, 19 of them measuring at bottom 5 x 11 feet 10 inches, and the other 6 of the same width but 23 feet 10 inches long, with slopes of 1 in 12 on all faces and 3 feet high, were substituted. The space between each crib was spanned with 15-inch 42 lb. steel I-beams, laid from 3 feet 7 inches to 4 feet apart with proper 5-in channel connections, over which were securely bolted 5 inch x 8 inch tamarack timber to support 3 inch pine flooring. A substantial 1½-inch iron pipe railing with cast iron posts completed the repairs.

These were carried on, without interfering in any way with the autumn and spring traffic, by day labour, except the steel structure which was furnished and erected as per contract, by the Dominion Bridge Company for the sum of \$3,600. The total expenditure during the fiscal year was \$9,001.45.

The pier was transferred to the control of the Department of Marine and Fisheries in August, 1896.

## CROSS POINT.

Cross Point, a village of Bonaventure county, is beautifully situated at the head of the Baie des Chaleurs, on the north shore of the Restigouche river, opposite Campbellton, N.B. The station of Cross Point, on the Atlantic and Lake Superior railway, is about two miles from the village. There is a ferry boat running from Cross Point to Campbellton.

In March, 1903, a contract was entered into for the construction of a wharf at this place; work was completed during the fiscal year 1903-04.

The structure is 455 feet long, 20 feet wide, except the outer end which is 35 feet wide, where the landing slip is built. It consists of a stone approach 60 feet long and 20 feet wide; a cribwork abutment, 20 by 20 feet; two cribwork piers, 20 by 20 feet, placed at intervals of 20 feet; and one outer block, 275 feet long. The spaces between the abutment, the piers and the outer block are spanned with stringers. The whole wooden structure is covered with planks, and built of close-face cribwork, ballasted with stone.

This wharf is intended to be approached at high tides only; during low water spring tides its outer end is left dry.

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Spring tides rise 11 feet.

During the last fiscal year 1904-05, the sum of \$99.95 was expended in putting re-enforcing piles, at the head of the pier.

#### CUISSES D'ALMA.

Les CuisSES d'Alma, in the Little discharge of Lake St. John, is three miles from the lake, in the parish of St. Joseph d'Alma, and seven miles from the village.

There are three rocks, called the CuisSES d'Alma, and an island which obstruct the Petite Décharge.

In 1901-02, blasting was done on the east side. Amount expended, \$575.92.

In the year 1902-03, the east side was completed and a portion of west side was done. Amount expended, \$1,229.37.

During the year 1903-04, the continuation of the blasting of the two points obstructing the Little Décharge are now completed, and the work was continued on the island a little below. Amount expended, \$1,477.59.

During the fiscal year 1904-05, the blasting of the little island was continued. Amount expended, \$995.58.

#### DESCHAMBAULT.

Deschambault, County of Portneuf, is a flourishing village on the north shore of the St. Lawrence and the Canadian Pacific railway, forty-one miles above Quebec. A steamer plies semi-weekly to and from Quebec.

In April, 1904, the department purchased a wharf for the sum of \$500 from 'La Compagnie des Bateaux à Vapeur de Deschambault et Lotbinière.'

During the last fiscal year, a channel approach to the wharf was cleared, some 7,000 feet long by 300 feet wide, boulders, reefs, &c., were removed by blasting. The work had to be done at low tides, when the 'batture' was left dry.

An expenditure of \$333.60 was also incurred for taking care of timber, purchased in view of the construction of a new wharf.

On December 16, 1904, a contract was entered into with Mr. F. Bernier, for the construction of a landing pier, at this place. Contract price, \$15,840.

The new wharf will be 274 feet long, and will consist: of an outer crib, 130 feet long and 48 feet wide on top, built of close-faced cribwork; a middle section 80 feet long and 26½ wide, built of open-faced cribwork; and the shore section, 64 feet long and 26½ feet wide, built of open-faced cribwork, with a batter of 1 in 1, for a height of 5½ feet from top, for the full length of the wharf, on the western face.

During the fiscal year 1904-05, the work has progressed very favourably, it is expected to be completed in October.

Total expenditure during 1904-05, \$9,828.76.

#### DESJARDINS.

During its session of 1904, parliament granted the sum of \$11,000 towards the construction of a wharf at Desjardins village, Allumettes island, on the River Ottawa, to accommodate the heavy traffic to and from Pembroke, on the opposite shore.

The wharf consists of an open-faced cribwork landing pier 120 feet long and 20 feet wide, built in 6½ feet of water at E.L.W.L. and an approach, 543 feet long and 16 feet wide at the top, built partly of open-faced cribwork piers, united by platforms, and stone rip-rap. The flooring is 8 feet above E.L.W.L.

A bulk sum contract, amounting to \$9,953.67 for this construction, was awarded to Mr. Thos. Moran, June 8, 1904. Work began in August, 1904, and was completed in June, 1905.

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Other works not provided for under the original contract were performed, viz.:

1. Changing of capping to form waling on approach to increase the width and to receive the base of standards for hand railing....	\$ 83 75
2. Addition of seven vertical fenders....	59 50
3. Removal of floor system and pulling out of pile-work, head of Desjardins' old wharf....	50 00

Extras paid to Mr. Thos. Moran....	\$ 193 25
Work performed by day labour amounted to....	30 50
Cost of inspection....	642 00
44 stone footings for the standards of hand-railing, on the rip-rap approach, were delivered at a cost of....	132 00
Expenditure for fiscal year 1904-05, \$10,957.42.	

## D'ISRAELI.

D'Israeli is a post settlement in Wolfe county, at the head of Lake Aylmer, and a station on the Quebec Central railway, some fifty-two miles north-east of Sherbrooke. It contains one Roman Catholic church, eight stores, two hotels, two lumber mills, one sash and door factory, telegraph, telephone and express offices. Population, 1,759.

The construction of the wharf at that place was begun by day labour at the end of September last. The work will consist of a close-faced 12 by 12 timber cribwork head block 50 feet by 36 feet and 17 feet high, standing fully ballasted with stone in 12 feet of water at mean level. A 30-foot steel span, composed of 15-inch 42 pounds I-beams with proper channel connections will connect head block with stone approach 200 feet long, 18 feet at top, with sides inclined 1 to 1½. A double 1½-inch iron railing, with 6-inch round cedar posts every 10 feet, will complete the whole structure.

At the end of present fiscal year, the stone approach had been completed and the crib head block about half so, at a cost of \$4,990.62.

## DOUGLASTOWN.

Douglastown, situated in Gaspé bay, is a village of fishermen and farmers, standing on the rising ground at the south side of the entrance to the St. John river; its population is between 1,600 and 1,800.

Gaspé bay possesses advantages which may hereafter render it one of the most important maritime places in the neighbourhood.

It contains an excellent outer roadstead off Douglastown. There is a harbour at its head capable of holding a whole fleet in perfect safety, and a basin, where large ships might be safely anchored and refitted, but there are no landing facilities, no shipping accommodation nor protection works for coasting craft. The roadstead, off Douglastown, is very extensive; vessels may anchor in any part of it, and in any depth from two to six fathoms over sand and clay bottom. There is, however, no shelter from winds between S.E. by E. and S.S.E., which blow directly into the bay and roll in a heavy swell.

In the early spring, when Gaspé bay and the entrance thereto are frozen over, the harbour of Douglastown is accessible, being clear of ice. Extensive lumbering operations are now in the way of increasing to a vast extent, both the local and export traffic in and around Douglastown, by the exploitation of extensive timber limits on the St. John and York rivers, and the erection of large saw-mills on the bar of Douglastown and Sandy Beach, some three and a half miles north-east of Douglastown.



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On April 28, 1904, a contract was entered into with Messrs. Heney and Smith for the construction of an isolated pier, in the sum of \$17,549.

The pier, when completed, will have a total length of 220, its inner end being at a distance of 1,780 feet from the shore; the width at bottom will be  $30\frac{1}{2}$  feet, and the sides will be built on the south side with a batter of 1 in 8, and on the other side with a batter of 1 in 12; the top will be 24 feet wide between the outer faces of the side face timbers.

Up to 2 feet above low water mark, the pier will be built in cribs of 110 feet; the superstructure will be built continuously, on the full length of the pier.

During the last fiscal year, two cribs, each 110 feet long, were placed in position, sunk and built up to high water mark.

The expenditure during 1904-05, amounted to \$10,349.86.

Spring tides rise 5 feet; neaps, 3 feet.

#### ENGLISH RIVER.

St. Jean Chrysostome is a post village in Chateauguay county, Que., on the Grand Trunk railway, four and one-half miles from Aubrey station and nine miles from Howick, where the English river flows into the Chateauguay river. It contains one church, five stores, two hotels, one grist and saw mills, one cheese and butter factory and one tannery. Population of parish, 2,207.

Every spring during the freshets, the English and the Black rivers overflow and cause considerable damage to the village and parish of St. Jean Chrysostome, an area of over 2,600 acres of good land being held for several days under from three to 5 feet of water. In order to prevent, or at least considerably minimize these disastrous floods, it was decided to deepen the bed of the English river, from its confluence with the Black river, opposite the village of St. Jean Chrysostome, a distance of 500 feet down stream by a width of 60 feet. In this area, the bed of the river is solid rock, some 4 feet higher than the normal bottom, thus acting as a dam which causes the water to overflow upon the surrounding low lands.

During the fiscal year 1903-04, a steam rock drill and boiler was bought and installed, and a certain quantity of blasting done at a cost of \$2,875.69.

This was continued during present fiscal year and the sum of \$4,823.55 expended. The work done by day labour will be completed with the next fiscal year.

#### ESCOUMAINS.

Les Escoumains, in the County of Saguenay, is situated on the north shore of the River St. Lawrence, twenty-one miles below Tadousac. A very important saw-mill, the property of the Saguenay Lumber Company, is located here, there is also a Roman Catholic church, telegraph and post office and several stores.

The harbour of Les Escoumains was obstructed by boulders.

During the year 1902-03, the sum of \$592.29 was expended in removing boulders.

During the year 1903-04, the blasting of the boulders, at the entrance to harbour, was continued. Amount expended, \$198.25.

On May 7, 1904, a contract was entered into with Bernier & Beaulieu for the construction of a wharf.

Work was commenced on July 25, 1904, and suspended for winter on November 1; the work done consists in the sinking of two cribs, 110 feet and 87 feet in length; respectively, in the building of an approach, 153 feet in length forming a total length of 350 feet with a width of 25 feet and a height of 21 feet, at the outer end.

Spring tides rise 15 feet, neaps 9 feet.

The amount expended during 1904-05, was \$8,420.



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## FABRE.

Fabre, a post village, eleven miles south of Ville Marie, on the Quebec shore of Lake Temiskaming, is the centre of a successful farming district of Pontiac county.

In 1903, parliament appropriated \$2,000 towards the construction of a wharf in Lavallée bay. On account of difficulties experienced in the location of said wharf, no work was done during the fiscal year 1903-04.

The sum of \$2,000 was revoked in 1904. On June 30, 1905, practically all required materials had been procured at a cost of \$1,329.03.

The wharf is to be of pilework, having a frontage of 40 feet and extending a distance of 240 feet from 7 feet depth contour to shore, followed by a stone approach 16 feet wide at the top and two hundred odd feet long to the roadway. Floor elevation 12 feet above ordinary low water level.

Expenditure for fiscal year 1904-05, \$1,329.03.

## FATHER POINT.

Father Point, in the County of Rimouski, is situated on the south shore of the St. Lawrence, about six and a half miles from the village of Rimouski.

Since April last, this place was made the regular station of the pilots of the lower St. Lawrence.

Spring tides rise 15 feet, neaps 8 feet.

On November 8, 1901, a contract was entered into with Messrs. Heney & Smith for the construction of a wharf 600 feet in length, by a width of 40 feet at the bottom and 32 feet at the top, and a depth of 16 feet at the outer end, at low water spring tides.

The work was completed in May, 1904, when another contract, for an extension of 200 feet was entered into with the same parties on May 27 of the same year.

At the close of the past fiscal year, the work was much advanced.

The total expenditure during 1904-05, was \$22,115.58.

## GATINEAU POINT.

Gatineau Point village, in the County of Wright, is at the intersection of the Gatineau and Ottawa rivers, two miles from Ottawa.

During the fiscal year 1885-86, a cribwork wharf, having a frontage of 107 feet and a depth of 8 feet at lowest water, with approaches providing for the different stages of water level, was built at this place; also a pile-work retaining wall 230 feet long to protect the bank and roadway on the upstream side of the wharf. The expenditure being \$3,850.84.

During the fiscal year 1889-90, the top of the retaining wall was raised 2½ feet to the level of the public road, and some gravel filling was done on the wharf at a cost of \$584.01.

During the fiscal year 1895-96, minor repairs to the wharf were made at a cost of \$18.

During the fiscal year 1896-97, ordinary repairs to the wharf amounted to \$245.76.

During the fiscal year 1899-1900, some minor repairs to the wharf were made at a cost of \$92.35.

At its session of 1904, parliament granted a sum of \$2,300 for urgent repairs required on the wharf and retaining wall.

During the fiscal year 1904-05, the superstructure of the wharf was reconstructed at a cost of \$2,171.04.

## GEORGEVILLE.

Georgeville is a village on the eastern side of Lake Memphremagog, in the county of Stanstead, and eleven miles to the southward of the village of Magog, at the head  
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of the lake. It is a port of entry of considerable importance, and all steamers plying between Magog and Newport (State of Vermont, U.S.A.), call at the wharf.

The landing pier was built by subscription from the several steamboat companies, which kept it in repair until 1888 when its control was assumed by the government. At that time it had a total length of 210 feet and a breadth of  $18\frac{1}{2}$  feet, and was supported on six cribs; a wing, of 56 feet by 12 feet, had been added at the outer end where the depth available at ordinary low water was about  $9\frac{1}{2}$  feet. As originally completed, it stood 18 inches above extreme high water, but owing to a permanent rise in the lake caused by the construction of a dam at Magog, its top was, till 1888, level with the surface of the water, the consequence being that during periods of high water, or when the wind blew strongly from the south, the paddles of steamers fouled with the pier and received more or less damage. The top of the wharf including the arm down to low water mark, was moved bodily to the west by ice in the spring of 1888, and many timbers were either completely torn away or broken, the platforms also sustaining considerable damage.

During the year 1888-89, some urgent repairs were made; the top timbers of each crib, excepting the two shore ones, being renewed as well as the platforms and flooring over the whole surface of the wharf, at a cost of \$661.43. In 1889-90, the sum of \$1,995.27 was expended for the construction of two cribs 12 feet wide, 37 feet long and 16 feet high, which were set in front of and firmly bound to the two which actually formed the head of the wharf to increase its resistance against ice shoves. The whole wharf was rebuilt from low water mark and raised 2 feet higher than its former level. In the course of 1895, the approach to the landing block being defective, the municipality removed the flooring and platforms between the shore and the fifth pier, and filled the whole with a solid earth and stone embankment, 160 feet long. In 1897-98, some stringers were renewed and the whole outer block was replanked. A new waiting-room was also built at a total cost of \$678.96.

In 1901, minor repairs to the flooring, &c., for \$161.51 and in October 1903, for \$78.57, were made.

During last fiscal year, more extensive repairs calling for an outlay of \$1,016.70 were undertaken. These consisted chiefly in the removing of five tiers of timber from the front, and three tiers from one end of the wharf and the replacing of same with 12 by 12-inch timber. The head block was completely filled with stone and floored, the same as the approach with layers of sand and gravel one foot thick. The wharf is now in good condition.

#### GRANDES BERGERONNES.

Grandes Bergeronnes, Saguenay county, is on the north shore of the St. Lawrence, 18 miles below Tadoussac.

The entrance to the river Grandes Bergeronnes being obstructed by boulders, a channel of about 150 feet was cleared from the entrance to the village, a distance of one mile.

In the years of 1887, 1895, 1899, 1901 and 1902, a total sum of \$254.32 was expended.

During the year 1902-03, the work done was continued by day labour. Amount expended, \$398.77.

During the year 1903-04, the work of clearing the channel was continued and a pier, 20 by 30 and 19 feet in height, was built. Amount expended for the construction of the pier was \$239.30.

During the fiscal year 1904-05, the landing pier was completed; another pier was built 20 by 30 feet with an approach of 20 by 40 feet placed 25 feet from the outer block. The whole structure is completed, fendered, sheathed and fully ballasted. The wharf is at present of the following dimensions, 85 feet in length by 20 and 60 feet in width, the outer block having 20 by 60 feet, the height is 19 feet at the outer end.

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The boulders around the wharf were removed and the cleaning of the channel of Grandes Bergeronnes was continued.

Expenditure during 1904-05 was \$1,762.58.

Spring tides rise 16 feet, neaps 9 feet.

## GRANDE VALLÉE.

Grand Vallée, County of Gaspé, is on the south shore of the River St. Lawrence, 68 miles below Ste. Anne des Monts, and about 45 miles by land from Gaspé basin.

With a view of affording much needed landing and shipping facilities to steamers, schooners and other small vessels calling at this place, as well as to give shelter to fishing boats in stormy weather, it was decided to build a breakwater at this place.

On June 29, 1901, a contract was entered into with Messrs. Heney & Smith for the construction of this wharf, near the mouth of the Grande Vallée river.

The structure has a length of 900 feet, a width of 25 feet on top at the inner end and 29 feet at the outer end, which is in a depth of 14 feet at the low water spring tides. It is built throughout of close face timber cribwork, with a batter of 1 in 10 on both sides, filled with stone and sheathed on the weather side with hardwood planks 6 inches thick. The top of the work stands 8 feet above high water spring tides.

Spring tides rise 9 feet.

The work was completed last fall, with the exception only of the iron corner straps not yet bolted into place.

The expenditure during the last fiscal year amounted to \$15,098.90.

## GRAND MÉCHINS.

On the south shore of the St. Lawrence, in the County of Rimouski, and thirty-five miles below Matane, are two villages called Little and Grand Méchins; the population consists chiefly of fishermen and men engaged in the lumber trade.

Owing to the clifly nature of the beach the coast of the St. Lawrence, between Grosses Roches and Capucins, is of very difficult access to schooners or other craft. Apart from the roads which are bad and hilly, the means of transportation is by way of the St. Lawrence, but it entirely lacks of proper harbouring.

With a view to afford shelter for all craft and to provide for the necessary accommodations required by the inhabitants, it was decided to build a landing pier at Grand Méchins, that would meet all the requirements of the place.

Contract plans were prepared for the construction of a wharf 600 feet in length, with a depth of water of 16 feet at low water tides, at the outer end.

During the fiscal year ended June 30, 1905, timber was purchased for the sum of \$3,487.16, which now is lying on the site of the proposed wharf, to be used in the construction.

Spring tides rise 13 feet; neap tides, 6 feet.

Total expenditure during 1904-05, \$3,597.36.

## GRONDINES.

Grondines, a post village in the County of Portneuf, is situated on the north shore of the St. Lawrence, forty-eight miles above Quebec, on the line of the Canadian Pacific Railway.

It contains a church, four stores, a saw-mill and a telegraph office. Two light-houses are located at this place. A steamboat from Quebec calls here twice a week. Population of village 440; population of parish, 1,500.

In February, 1904, the department acquired a water lot and wharf at this place.

It was intended to enlarge the present wharf, the work to be done by day labour, but later, the department decided to let the work by contract.

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The total expenditure during 1903-04, including materials purchased, &c., amounted to \$4,395.60.

During the last fiscal year, a contract was entered into with Mr. Alphonse Lemay, for the construction of the proposed enlargement. Contract price, \$14,500.

Work has progressed very satisfactorily, and it is expected that it will be completed in October, 1905.

Total expenditure during 1904-05, is \$7,500.57.

#### GRINDSTONE.

Grindstone is a village on the south side of Grindstone island, four miles east of Etang du Nord. The population is composed mostly of Scotch farmers and Acadian fishermen.

For years past most of the freight for the Magdalen islands has been landed here and the building of a landing pier was greatly needed. In the fiscal year 1901-02, a landing pier was started; one hundred and fifteen feet of close-faced cribwork on an average width of 23 feet and of an average height of 15 feet was built.

An approach of 605 feet 25 to 50 feet wide and of an average height of 9½ feet on the outer face, was built along the eastern side of Grindstone cape.

The outside face of the approach, exposed to the ocean, is protected by a sheathing of split logs held in place by two sets of walings fastened by cross-ties and a double set of posts. A mattress of brush was laid under the stone filling, taken from the cape.

During the fiscal year 1902-03, the pier was extended 255 feet, with an average width of 25½ feet and an average height of 19 feet to coping or floor level.

In the fiscal year 1903-04, the pier was extended 200 feet with an average height of 22 feet and an average width of 28½ feet.

Six feet of the superstructure of the last 100 foot crib was built up in July and August, 1904. From August to October, a crib 100 feet long by 30 feet wide and 26 feet high was built ashore, where it will have to remain until the work is resumed.

The amount expended during the fiscal year of 1904-05, is \$9,298.69.

Spring tides rise 4 feet; neap tides, 2 feet.

#### ILE AUX COUDRES.

The island has an area of 30 miles and is situated in the County of Charlevoix, 62 miles below Quebec. The distance from this island to the north shore of the St. Lawrence is about 1½ miles. Its population is 1,500.

In order to tie the new crib that had a tendency to turn over, a part of the old wharf and of the new extension was demolished and reconstructed; a great quantity of face timber that had been broken by the ice during the winter was replaced.

A part of the east side of the wharf was sheathed with hardwood and about one half of the flooring was made anew.

The expenditure for the fiscal year amounts to \$1,937.27.

#### ILE AUX GRUES (SOUTH SHORE).

Iles aux Grues (Crane island), is in the River St. Lawrence, opposite Cape St. Ignace, in the County of Montmagny, about forty miles below Quebec.

Spring tides rise 20 feet, neaps 12 feet.

Farming is the chief occupation of the inhabitants.

The heavy repairs to the wharf, undertaken three years ago, were completed during the fiscal year 1904-05.

The superstructure of the shore end, upon a length of 200 feet and a mean of 10 feet was entirely renewed; cedar was used for the face timber, cross-ties and longitu-

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dinals, and spruce for the top planking and cap timbers. About 15 toise of stone ballast were added in, and 4 ladders were placed where needed. The sheathing of the outer face and 100 feet long on both sides, was renewed with elm and birch 6 inches thick, and the corners protected with iron straps  $\frac{3}{4}$  by 4 inches. The work was performed during the months of August and September at a cost of \$3,181.73.

## ILE VERTE.

The village of Ile Verte, in the County of Temiscouata, is situated on the south shore of the St. Lawrence, 16 miles below Rivière du Loup, and 130 miles east of Quebec.

Spring tides rise 19 feet, neap tides, 12 feet.

During the fiscal year 1904-05, in order to improve the harbour, some work was done to remove boulders in the vicinity of the wharf; the boulders were blasted and taken away on scows; over 600 cubic yards of stone have been removed.

Repairs were also done to the wharf.

The expenditure during the last fiscal year was \$800.

## ISLE BIZARD.

Isle Bizard is a parish in the County of Jacques Cartier, on an island in the Lake of Two Mountains, five miles north of Pointe Claire and twenty-seven miles from Montreal.

In 1890, a pier was built consisting of four close-faced and stone filled cribs with ice-breakers, 20 x 30 feet at low water level and 20 feet square at top, placed at from 28 feet 9 inches to 31 feet 3 inches apart, and spanned with 12 x 12 inches floor beams and 3-inch pine flooring. An approach 43 feet long completed the structure at a cost of \$8,708.42.

In September, 1904, extensive repairs were begun. The three top tiers of the three outer cribs were renewed, 12 x 12 inch vertical posts inserted at all corners and screw bolted securely to face and side; the whole slanting face covered with  $\frac{3}{4}$ -inch boiler plates, and the shore abutment rebuilt 5 feet from top. The old stringers between each crib were removed and replaced by three 30-foot 18-inch steel I-beams, with 8-inch channel connections and 6-inch steel I-stringers bolted over and across 3 feet centre to centre, to support 3-inch pine flooring laid diagonally. An iron lattice running 176 feet 6 inches on both sides, with proper angle iron posts, completed the repairs. These were done by day labour, except the steel structure which was furnished and erected as per contract by the Phoenix Bridge and Iron Works Company, for the sum of \$1,500.

The total expenditure during fiscal year was \$2,885.47.

## ISLE PERROT (NORTH).

Ile Perrot is in the St. Lawrence, south-west of the island of Montreal, between Lake of Two Mountains and Lake St. Louis. The island about seven miles long is in the County of Vaudeuil.

In 1897-98, a small wharf with a right of way on the north side of the island, was purchased from Mr. Joseph Leduc for the purpose of providing a convenient landing on the Ottawa river shore. This right of way is 400 feet long and extends from the public road to the wharf, the first 355 feet having a width of 30 feet, and the remainder, near the river, a width of 100 feet. The wharf is close to and parallel with the shore, and is 20 feet wide by 52 feet long.

In June, 1898, this wharf being found in a dilapidated condition and otherwise inadequate to the requirements of the traffic, a close-faced timber outer block, 80 feet long, 20 feet wide and 19 feet high, was built and sunk close to the old wharf,

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in 13 feet of water. The work done by day labour, was completed, including approach, in June, 1899, at a cost of \$3,328.71.

The village of Kamouraska, in the county of same name, is situated on the wharf damaged by ice repaired, and some stone placed to support the storehouse. This called for an expenditure of \$10.41.

The wharf was transferred to the control of the Department of Marine and Fisheries in October, 1897.

## KAMOURASKA.

The village of Kamouraska, in the county of same name, is situated on the south shore of the St. Lawrence, ninety miles below Quebec; it is a well known place, much frequented as a summer resort.

Spring tides rise 19.5 feet, neaps 12 feet.

In May, 1904, in order to provide shelter for schooners and other vessels, and upon the pressing request of the navigators and business men of the place, it was decided to repair the old block standing on the west side of the new wharf, and to connect it with the shore by a light cribwork, 175 feet in length, on a width of 20 feet. Part of this work was performed in May and June, 1904, it was completed during the fiscal year ended June 30, 1905.

An addition to the old block has also been built; it is triangular in figure, with sides of 98.75 and 40 feet on a height of 20 feet, the whole is now completed.

The expenditure during 1904-05, amounted to \$1,499.02.

## KNOWLTON LANDING.

Knowlton Landing is situated on the west shore of Lake Memphremagog, in the County of Brome and about 11 miles from the town of Magog. It is a summer resort.

During the fiscal year 1891-92, an extension to the pile wharf at this place was constructed. This extension of 51 feet by 75 feet was built of hemlock piles, covered with stringers and 3-inch planking, at a cost of \$971.22. There is a depth of 9 feet at low water at the end of the present wharf, which will permit of the steamers calling at all stages of water.

During the next year, six fender piles were driven along the front of the wharf and three at each corner. A warehouse with waiting-room, 40 feet by 23 feet was built and covered with an iron plate roof.

In the fiscal year 1899-1900, all the stringers and planking were renewed, also the corners fender piled, and some repairs made to the storehouse and stone approach. The work was carried out by day labour at a cost of \$714.12.

During March, April and June, 1904, several caps and stringers were renewed general overhauling of the flooring made and two iron nigger heads substituted for the old hemlock mooring posts. Expenditure, \$176.52.

In July, 1904, these repairs were continued and completed at a further cost of \$60.99.

## LAC À BEAULIEU.

Lac à Beaulieu, in the municipality of Les Grandes Bergeronnes, is situated three miles north of the village.

The outlet of Lac à Beaulieu is obstructed by boulders and rock, which render the floating of logs very difficult.

During the year 1903-04, a certain quantity of boulders and a ledge of rock were blasted.

Amount expended, \$297.76.

During the fiscal year 1904-05, the work of removing boulders was continued at the cost of \$200.36.

Total amount of expenditure to July 1, 1905, is \$498.12.



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## LAKE LABELLE.

Lake Labelle,  $12\frac{1}{2}$  miles long and  $\frac{1}{4}$  to 1 mile wide, is situated in the county of Labelle, some 6 miles from Labelle village.

In order to improve the transportation facilities of the surrounding settlements, three wharfs were built on the lake; one at Damase Labelle's place, another at Dr. Brisson's, and the third one opposite the club house.

They all consist of an open face round timber stone ballasted crib head block, 31 feet 4 inches long and 21 feet 4 inches wide, standing 12 feet high in 5 feet of water, with crib and span approach 13 feet wide and 143 feet long at Labelle's, 20 feet long at Brisson's and at the club's.

The rights of way to these wharfs were given by their proprietors except the one at Damase Labelle's, some 720 feet long and 26 feet wide, which was sold to the Crown for the sum of \$50.00.

All these wharfs, built by day labour, begun in April, 1905, and where completed at the end of June, at a cost of \$1,225.27.

## LAKE MEGANTIC.

Lake Megantic, between Compton and Beauce counties, has a length of two miles, a breadth of two to four miles with a coast line of over thirty-six miles. This lake and the rivers that empty into it are the head water of River Chaudière. Lake Megantic village, in Compton county, is on the Canadian Pacific railway, sixty miles from Sherbrooke. It contains two churches, one large saw-mill, a furniture factory, several stores, three hotels, telegraph office. Population, 1,883.

From 1882 to 1887, seven wharfs costing from over \$5,000 to \$7,000 were built on the lake, to accommodate the trade of the localities: St. Agnes, Lourdes, Flint, Victoria Bay, Ditchfield, Piopolis and Lake Megantic.

At the latter place some extensive renewals to the flooring were made in 1888-89, at a cost of \$873.02.

In 1897-98, the wharf had to be repaired and raised 4 feet on account of the rise of the lake, caused by a dam constructed in 1895 by the Montague Pulp Company, across the Chaudière river, at its outlet from the lake. Cost, \$1,244.48.

In 1900, an open shed, 20 feet by 30 feet, was built at the head of the pier with a waiting room and small freight shed, at a cost of \$302.08.

During September and October, 1900, part of the earth surface of the pier, that is 180 feet by 22 feet, was raised 15 inches at a cost of \$346.75.

In November, 1903, minor repairs to the extent of \$51.13 were made.

During last fiscal year, the head block was raised one foot, a new floor put on, the storehouse painted, the approach raised one foot and widened 6 feet with rip-rap on the side sloped 1 in 1. A guard railing completed the structure at a total cost of \$1,149.03.

The wharf is transferred to the Department of Marine and Fisheries since July, 1887.

## LANORAIE.

The village of Lanoraie is situated on the north shore of the St. Lawrence, in the County of Berthier, forty-six miles below Montreal. It has considerable trade in flour, grain and cordwood.

Construction.—In 1884, the construction of an isolated block 70 x 30 feet at the bottom and 54 x 27 on top, was commenced at a distance of 240 feet from shore; the work was completed in 1885, at a cost of \$5,032.01. In 1885-86, the block was connected to shore by an approach of 240 feet long, 25 feet wide, and an average height of 12 feet, at a cost of \$6,886.36. The upper or western side of this approach, for a height of six feet from the top, was built on a slope of 6 inches per foot and sheathed



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with 4-inch tamarack planks, and the top of the approach was built on a grade of 4 feet per hundred. The depth of water at the head of the pier is 11 feet at extreme low water.

Repairs.—During the winter of 1887, the approach was damaged by an ice shove which curved it slightly towards the east. In April, 1891, it was again moved to the eastward by another ice shove which increased the pitch of the curve to 4 feet, at a distance of 80 feet from the head block, and removed two courses of face timber on a length of 42 feet, and face fenders on its lower or eastern side. Repairs were commenced on November 5, 1891, and completed on the 28th of the same month at a cost of \$416.04. The missing face timbers and fenders were replaced and fender piles were driven 10 feet apart along both faces of the approach.

General repairs were effected to the pier in 1896-97, at a cost of \$1,008.27. The face timbers, fenders and cap pieces were renewed where broken or decayed, and the sloping faces of the head block and of the approach were re-sheathed.

During the year 1898, the flooring of the pier was completely renewed with 3-inch hemlock deals, and general repairs were effected at a cost of \$531.30.

During fiscal year 1898-99, the stone talus, in front of the wharf having been carried away by ice was rebuilt by day labour, at a cost of \$588.77.

General repairs to flooring, &c., to the extent of \$884.92 were made during fiscal year 1899-1900.

During November and December, 1901, a round timber ice-breaker was built along the whole western side of the approach. On the eastern side, braces 12 x 12 inches, every 10 feet, were placed at an angle of 45 degrees with the approach and secured at the bottom to a longitudinal piece also 12 x 12 inches, well anchored to the ground in a bed of rock. The whole work by day labour at a cost of \$3,999.83.

Minor repairs in 1902-03 and 1904, to the extent of \$64.18 and \$10.61 respectively, were made.

During the year 1904-05, the sum of \$674.20 was expended in the renewal of some stringers and the whole of the flooring.

#### LAPRAIRIE.

Laprairie is the chief town of the county of the same name, and is situated on the south shore of the River St. Lawrence, 7 miles above Montreal. It contains churches for the Episcopalians and Roman Catholics, a convent, an orphans' home, a foundry, a saw and carding mill, a brickyard, telegraph office, 5 hotels and about 20 stores. A steam ferry runs between Laprairie and Montreal, making several trips a day. The population is about 2,500. It is a beautiful spot, near Lachine rapids, much frequented in the summer.

In 1886, the government undertook to protect Laprairie from the disastrous effects of the spring floods and ice shoves of the St. Lawrence, by constructing ice breaking piers, a revetment wall of cribwork some 1,650 feet long and 20 feet wide along the shore of the river in front of the town, and at its upper limit an earth embankment 1,600 feet long.

In 1886-87, two ice piers were built 250 feet apart, at the upper end of the town, facing the St. Lawrence river, at a cost of \$6,736.19.

In 1887-88, an earth embankment was constructed from the shore for a length of 1,600 feet, at the western limit of the town. A cribwork retaining wall was also built for a length of 480 feet half way between the eastern icebreaker and the Richelieu company's wharf. This wall was 20 feet wide 10 feet high from low water mark and filled principally with stone. Amount expended \$4,989.75.

In 1888-89, 1889-90, another cribwork retaining wall 335 feet in length, from the Richelieu wharf westward, was commenced and completed to a height of 16 feet above low water mark, at a cost of \$7,560.52. It was built of open cribwork 20 feet in width with a batter of one in 12 on the outer face.

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In 1890-91, some general work was done in sheathing the walls previously built, at a cost of \$658.58. In 1891-92 the retaining wall at the lower end of the town, adjoining the Richelieu wharf, was extended a further 131 feet, at a cost of \$2,495.10.

In 1892-93, a further extension to the wall 420 feet long, was built to a height of 8 feet above low water mark, at a cost of \$2,589.51.

In 1893-94, the remaining portion of the wall, built between the eastern ice-breaker and the Richelieu wharf, 284 feet in length, was completed to a height of 10 feet, at a cost of \$2,387.39.

In 1895-96, the sum of \$2,015.51 was expended in constructing a stone protection work between the two icebreakers, the distance being 250 feet, and raising a portion of the retaining wall to an elevation of 15 feet above low water mark.

In 1896-97, 387 feet in length of cribwork wall was raised to the level of 16 feet, at a cost of \$4,400.36.

In 1897-98, the revetment wall was completed to a height of 12 feet above low water mark, at a cost of \$5,640.64. The whole of this work was built of round logs, filled with stone and sheathed with 3-inch pine planks.

During May and June, 1899, the earth embankment at the south-west of the village, in connection with the protection wall, was raised from one to two feet to the level of the said protection wall, on a distance of 1,000 feet; the riprap, from the ice-breaker to the embankment, which was badly damaged, was renewed and put in good condition. The work was done by day labour at a cost of \$1,659.86.

During 1901-02, the western icebreaker being found much decayed and dilapidated was removed, and a new one of the same size substituted. Cost \$1,057.02.

In 1902-03, the eastern icebreaker was likewise removed and a permanent concrete structure erected in its place, at a cost of \$3,653.49. It has a length of 40 feet by a width of 22 feet at the base and a height of 25 feet. The side facing the St. Lawrence is sloped  $1\frac{1}{2}$  in 1. Other repairs were made to the protection wall to the extent of \$1,345.59, making the total outlay for the year, \$4,997.08.

During July and August, 1903, further repairs to the protection wall were made by day labour, at a cost of \$818.74. Two sections known as Nos. 2 and 4 of this wall being found too much decayed for ordinary repairs, it was decided to replace them by a substantial concrete wall.

To this effect, in November, 1903, after tenders had been called for, a contract was entered into with Messrs. Amiot and Lemay, of Montreal, for their construction at a cost of \$29,650. The new walls were built in front of the old wooden ones, the space between the two being filled with stone, at distances varying from nothing to 5 feet; they have a cross section of 7 feet 8 inches at the bottom with the outside face inclined 1 in 12 and the back with recedes of 2 feet at a height of 4 feet and of one foot at a height of 9 feet with further batter of one in 12 from a height of 15 feet to the top. The height of the walls was to be 18 feet according to specifications, but in order to add still better protection to the town, it was deemed advisable to modify this to  $19\frac{1}{2}$  feet thereby reducing width at top, on account of the two batters, from 3 feet to 2 feet 9 inches. Two  $1\frac{1}{2}$ -inch anchor bolts with 1 foot square and 1-inch thick iron plates connect, every 20 feet, the new wall with vertical post securely bolted inside the face of the old wall. Six inch vitrified drain pipes inclined 1 in 12 from the lower recede were inserted every 50 feet.

The outside face of wall was strengthened on account of added height with  $1\frac{1}{2}$ -inch iron bars 16 feet long placed every 5-foot section. No. 2 has a face length of 413 feet with angle wings of 26 and 16 feet, and section No 4 a length of 334 feet with returns of 19 and 14 feet.

At the end of June, 1904, the work was about half done, at a cost of \$14,072.30, making total expenditure for the year \$14,951.04.

During 1904-05, the above contract was continued, sections 2 and 4 being completed at the beginning of September at a further cost including extras of \$18,195.53.

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In the spring of 1905, it was decided to have the contractors commence the construction of section No. 1, near the icebreaker, as a further extra to main contract and at the schedule of prices contained therein. To the end of June, a supplementary sum of \$6,128.45 had been expended, making the total outlay for the year \$25,494.07.

## LES ÉBOULEMENT.

Les Eboulement is a village of the County of Charlevoix, with a population of about 1,000, situated on the north shore of River St. Lawrence, 70 miles below the city of Quebec. This place is quite frequented by tourists as a summer resort.

During the present year four mooring posts were replaced also three lengths of face timber. The flooring was renewed in many places and a few floor stringers were put in.

The expenditure for the fiscal year amounts to \$25.40.

## LES ÉCUREUILS.

Les Ecureuils, a village in the County of Portneuf, is situated on the north shore of the St. Lawrence, 28 miles above Quebec. It is distant from any railway communications and difficult to approach by water.

Population 600.

During the last fiscal year, the landing pier, which was not sufficiently large for the local traffic, was enlarged by the addition, at its outer end, of a head block, 45 feet long, 30 feet wide and 16½ feet high.

The structure is of close faced square timber cribwork, sheathed the full height with 3-inch spruce deals; the flooring is of 3-inch pine deals.

The old wharf was also strengthened and the 3-inch sheathing almost entirely all renewed; repairs were made to the freight shed including painting of same. A small waiting room of 10 by 15 feet was also supplied for public accommodation, the wharf being completely isolated from the village and shelter.

Owing to the undermining, by water from the cliff, of the inshore gravel embankment, a large excavation was made on west side and filled up with stone, taking about 200 loads well placed and packed with under surface drainage outwards to beach.

Guard rails were placed on narrow part of old wharf.

The expenditure during 1904-05, was \$3,396.22.

## LE TABLEAU (DESCENTE DES FEMMES).

Le Tableau (Descente des Femmes), is a new settlement on the north side of the River Saguenay, about 61 miles from its mouth. To promote colonization in that part of the Saguenay district, which has no other communication than by water, it was decided to build a wharf at this place.

During the year 1902-03, a block, 40 feet in length, 30 feet in width with a return of 30 feet by 25 feet and two piers 25 by 25 feet placed 25 feet apart, were commenced.

The block was sunk in 18 feet of water. The block and the return forming an 'L' are built of close-faced timber, 11 by 11 inches sheathed at the outside corners with hardwood.

There is a landing slip on the outer block and one in the return on the west side. The piers are built of round logs open-faced.

Amount expended \$5,033.71.

During the fiscal year 1903-04, the work was continued and an approach was built. The corbels were laid as well as part of the stringers.

The outer end of the structure is 3½ feet high on top of stringers. The work was done by day labour.

Amount expended \$2,970.

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The wharf is 193 feet in length and 25 feet in width. The outer block, 30 by 40 feet high, is not completed.

During the year 1904-05, the work was damaged by ice and had to be reinforced, the stringers and corbels were completed, fenders of 8 by 10 inches were on, and part of the planking done.

Expenditure \$987.24.

Spring tides rise 17 feet, neaps 9 feet.

## LOTBINIÈRE.

The village of Lotbinière, in the county of the same name, is situated on the south shore of the St. Lawrence, about 40 miles above Quebec. It has no railway communication and entirely depends for exchange of supplies on bateaux and steamers from Quebec.

Spring tides rise 14½ feet, neaps, 8½ feet.

In 1897, the department constructed at this place, an isolated block, connected to the shore by a removable approach of trestle bents.

On May 7, 1904, a contract was entered into for the construction of a permanent approach from the shore to the isolated block. Contract price, \$13,400.00. At the end of the fiscal year 1903-04, work was commenced but not completed.

During the fiscal year 1904-05, the work under contract was completed.

A sum of \$4,000.00 was granted for repairs to the old block, but only a small amount could be used, owing to the impossibility of procuring the necessary timber.

Some 3,200 pounds of new ¾-inch steel plates and 6 sheets of old plates were laid on old block; guard cast iron posts with two strands of No. 9 wire were placed on both sides of new roadway; the length protected by wire is 500 feet from shore out. The posts are arranged to be removed in the fall on account of ice going over wharf.

Before the end of the fiscal year, timber and materials, to carry on repairs during ensuing fiscal year, were procured.

The total expenditure during 1904-05, is \$10,719.99.

## LOWER ST. LAWRENCE, REMOVAL OF ROCKS.

Small expenditures were incurred at the following places for removal of rocks, &c. This work, which has been going on for some years, has proved of great benefit to fishing communities interested.

Newport, Gaspé county.. . . .	\$ 31 01
Little River East, Gaspé county.. . . .	125 00
Roche à Menon, Gaspé county.. . . .	25 00
Grand Pabos, Gaspé county.. . . .	100 00
White Head, Gaspé county.. . . .	25 00
Ste. Anne des Monts, Gaspé county.. . . .	25 00
Grande Tourelle, Gaspé county.. . . .	76 00
Cap d'Espoir, Gaspé county.. . . .	75 00
Grande Rivière, Gaspé county.. . . .	150 00
Little Pabos, Gaspé county.. . . .	25 00
Chien Blanc, Gaspé county.. . . .	50 00
Jersey Cove, Gaspé county.. . . .	304 40
Little River West, Gaspé county.. . . .	75 00
Petite Vallée, Gaspé county.. . . .	50 00
Cap Chat, Gaspé county.. . . .	90 50
Cape Cove, Gaspé county.. . . .	200 00

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## MAGOG.

Magog, a thriving incorporated town, is on the Magog river, at the outlet of Lake Memphremagog, in Stanstead county, and a station on the Canadian Pacific Railway, three hours from Montreal. It is a sub-port of entry and contains four churches, thirty stores, four hotels, saw and grist mills, Dominion Cotton Company's mills with 800 operatives, three bakeries, one carriage factory, one newspaper, two telegraphs, two express offices and good schools. Population, 3,516.

In order to accommodate the local trade, a landing pier was purchased in August, 1875, for the sum of \$2,500.

It is situated opposite the railway station, and consists of a pile structure 430 feet long, 24 feet wide for the first 305 feet from the shore, and 40 feet wide for the remaining 125 feet. Its head is  $12\frac{1}{2}$  feet high above the bottom of the lake, and stands in  $7\frac{1}{2}$  feet at low water.

Repairs.—In 1896-97, the most urgent repairs to the flooring were effected at a cost of \$154.82. In 1899, a number of broken planks in flooring were renewed at a cost of \$49.00.

During the year 1899-1900, three-fourths of the flooring was renewed and a new storehouse and guard railing built, at a total cost of \$530.07.

In 1901-02, minor repairs were made at a cost of \$11.34.

During 1903-04 extensive repairs were begun. The landing pier had become dangerous owing to decay, and the roadway was in a bad state. The latter, the property of the C. P. R. was moreover very inconvenient and a change of site was decided upon. To that effect, permission was obtained from the town council to build a stone approach, from the foot of Lake street to the head of the pier, a distance of 200 feet; it was made 26 feet wide at the top with ordinary slopes. The head block was lengthened 8 feet by its whole width, 40 feet, and caps, stringers and flooring were entirely renewed.

These were about one third finished at the end of June, 1904, at a cost of \$1,806.58, and completed in 1904-05, at a further expenditure of \$3,241.13.

## MAGUASHA.

Maguasha is situated in the Baie des Chaleurs, in the County of Bonaventure, opposite the town of Dalhousie, New Brunswick, at the entrance to the river of the same name, twelve miles from Carleton. The nearest railway station is 'La Nouvelle,' on the Atlantic and Lake Superior Railway.

On June 18, 1904, a contract was entered into for the construction of a wharf at this place, in the sum of \$7,500.

It consists of a stone approach 21 feet long, 20 feet wide on top with sides and end sloping 1 in 1; three cribwork piers 20 by 20 feet with spans of 20 feet; and an outer block 180 feet by 20 feet, the whole built of open-face cribwork, covered with 6-inch sheathing. The top of the flooring stands 4 feet above high water spring tides, or 13 feet 5 inches above low water spring tides.

Spring tides rise 9 feet 5 inches.

This wharf was built and completed during the fiscal year 1904-05, at a total expenditure of \$3,695.

## MARIA.

Maria, Bonaventure county, is a prosperous village on the north coast of Baie des Chaleurs and a station on the Atlantic and Lake Superior Railway, about ten miles north-east of Carleton. Population, 2,300.

During the fiscal year 1902-03, the department constructed a wharf at this place. The structure has a total length of 932 feet, a uniform width of 20 feet, covered with 3-inch planks.

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Spring tides rise 9 feet.

During the last fiscal year, the sum of \$502.50 was expended in improving the road leading to the wharf.

## MASSON.

Masson village, also known as Buckingham junction, Labelle county, is situated on the Lièvre river which empties into the Ottawa one mile below. In the opposite direction—three miles upstream—the Lièvre furnishes extensive water power which is the 'raison d'être' of several flourishing industries in the town of Buckingham. The population of this district is about 6,000. The traffic warrants the improvement of navigation facilities.

At its session of 1904, parliament appropriated \$5,000 towards the construction of a wharf on the River Ottawa near the mouth of the Lièvre river.

During the fiscal year 1904-05, construction of a permanent wharf was commenced. When completed, it will consist of a head block 30 feet by 90 feet providing for a depth of 8 feet at lowest water, with landings for the different stages of water level, and connected to the shore by means of two approaches 195 feet and 100 feet long respectively by 18 feet wide at the top. The understructure is of close-face crib-work and the superstructure of concrete cribwork, structural steel and dry masonry.

On June 30, 1905, the understructure had been built and 80 per cent of the required materials had been procured.

Expenditure during fiscal year 1904-05, \$5,063.60.

## MATANE.

The village of Matane in the county of Rimouski, is situated on the south shore of the St. Lawrence, at the mouth of the River Matane, 240 miles below Quebec, and thirty miles from Little Metis station, the nearest point of the Intercolonial railway.

It contains extensive saw-mills and a spoolwood factory.

Spring tides rise 14 feet; neap tides, 7 feet.

The breakwater, standing on the west side of the mouth of the River Matane, was badly damaged by ice and had to be partly reconstructed. It consists of piers on which is laid a flooring, with a sheet piling in front; it runs parallel to the river and has a total length of 500 feet by a height of 23 feet on the seaward face.

During the last fiscal year, the breakwater has been thoroughly restored; the piers were so badly damaged, that in order to secure the sheet piles and ensure stability to the whole structure, auxiliary cribs had to be built in the openings between the old piers. The sheet piling was entirely renewed with spruce 10 inches thick, each piece being sunken into the bottom as much as possible.

The flooring has also been repaired and a large quantity of stone ballast added.

A large quantity of the materials were purchased and paid for out of the last year's appropriation, but all the work was done during the last fiscal year by day labour.

Total expenditure during 1904-05, \$1,878.36.

## MILLE VACHES.

Mille-Vaches is a village in the County of Saguenay, situated on the north shore of River St. Lawrence, about forty-two miles below Tadousac. It contains one Roman Catholic church, three stores, two blueberry factories, one saw-mill, telegraph and post office. Population about 600.

During the fiscal year 1904-05, a certain quantity of timber was bought in view of the construction of a wharf, at this place.

Amount expended, \$1,003.14.



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## MISTOOK.

Mistook, in the township of Taillon, on the Grande Décharge of Lake St. John, in the County of Chicoutimi, is also called St. Cœur de Marie; it contains one Roman Catholic church, post office, several stores, two cheese factories and two saw-mills.

During the year 1903-04, a pier 40 feet long at bottom and 30 feet at top, by 30 feet wide and 23 feet high was sunk at 150 feet from high water mark. It is built with an ice-breaker in front, sheathed with 9-inch hardwood, and a landing slip on the outside face. The pier is built of round logs open-face cribwork fendered at every 8 feet; the work was done by day labour. Amount expended, \$2,059.

During the fiscal year 1904-05, the wharf, which was commenced in 1903-04, was continued, five piers of 20 x 25 feet were sunk in place.

Amount expended, \$5,001.05.

## MONT LOUIS.

Mont Louis, a village of considerable importance and the first municipality below Ste. Anne des Monts, is 135 miles below the nearest Intercolonial Railway station, Metis. The harbour of Mont Louis, the largest and best situated on the St. Lawrence, Gaspé coast, offers good water and good protection against all winds except from northerly winds.

The landing pier, being from the west shore towards the east outside point of the bay, will, when completed, shelter against northerly winds.

Two cribs forming a total length of 185½ feet by 25 feet wide were built and completed, with the exception of the flooring and 100 feet long by 7 feet high of the shore end superstructure.

The depth at the outer end is 15½ feet at low water spring tides.

Spring tides rise 9½ feet; neap tides, 5 feet.

The expenditure during the last fiscal year is \$3,003.25.

## MONTREAL HARBOUR—LOWER DIVISION.

*Maisonneuve.*

On July 25, 1900, a contract was entered into with Messrs. Poupore & Malone, for the construction of a high level pier and two bulkheads in the lower division of the Montreal harbour. Contract price, \$631,033.33. Work was commenced during the same year. During the fiscal year 1900-01, the expenditure amounted to \$49,296.45; in 1901-02, to \$201,722.69; in 1902-03, to \$251,320.47 in 1903-04 to \$209,104.96.

During the last fiscal year the fourth season of actual work on this wharf the W. J. Poupore Company, Limited, successors to Poupore & Malone, performed the following works:

As the sinking of cribwork sections was completed in 1903, the items of work consisted only in laying footing blocks of concrete, in building concrete walls and in earth refilling in rear of walls, the material for refilling being excavated from the two basins adjoining the new pier.

The length of footing block foundation laid was: 780 feet in 1904 and 150 feet in 1905.

The length of wall, built to the level of 18 feet above datum, was 1,927 feet in 1904.

In 1905 the building of concrete walls to full height of 28 feet above datum was resumed on the west wall, and a length of 1,143 feet built from May 16 to June 30, 10 feet high.



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The refilling behind walls was carried on and a quantity of 137,900 cubic yards deposited, from July 1 to November, 1904, and 4,200 cubic yards in June, 1905, forming a total for the fiscal year of 142,100 cubic yards measured as refilling.

The quantities of each item were as follows :—

	Cubic yards.
Concrete footing blocks laid. . . . .	1,576
Concrete in monolithic walls. . . . .	5,215
Concrete in extra height of 5 feet. . . . .	1,328
Excavation for refilling. . . . .	142,100

The expenditure for the fiscal year 1904-05, was \$74,442.69.

## MURRAY BAY.

The village of Murray Bay or Malbaie has a population of 3,500; it is situated on the north shore of the St. Lawrence, at the mouth of the River Malbaie, eighty-three miles below Quebec.

During the last winter, both corners of the wharf were badly cut by the ice, at the low water mark, all the stone of the two corner compartments had fallen into the river. The hardwood sheathing of the mooring face had also suffered considerable damage from the ice, these damages were repaired during the early spring of the fiscal year 1905.

At the request of the Department of Marine and Fisheries which run a ferry boat, the steamer *Champlain*, from Murray Bay to Rivière Ouelle, in connection with the trains of the Intercolonial railway, a new freight shed, office and waiting-room were constructed in prolongation of the existing buildings, on the east side of the wharf.

The expenditure for the fiscal year 1904-05 amounts to \$3,081.29.

## NEW CARLISLE.

New Carlisle, a seaport town and port of entry, the shiretown of Bonaventure county, is beautifully situated on the north shore of Baie des Chaleurs. It contains 2 churches, 2 hotels, several stores, a telegraph office and a printing office. It is the present northern terminus of the Atlantic and Lake Superior railway.

A pier, 606 feet long, from 29 to 49 feet wide, reaching 15 feet water at L.W.S.T., was built by this department between 1881 and 1883.

During the last fiscal year the sum of \$4,066.89 was expended on urgent repairs.

## NEWPORT.

The village of Newport, in the county of Gaspé, is situated at the mouth of the river of the same name, on the north shore of the Baie des Chaleurs, 88 miles east of Campbellton, N.B., and 50 miles west of Caplan.

Spring tides rise  $4\frac{1}{2}$  feet, neaps  $2\frac{1}{2}$  feet. The population of the village is extensively engaged in fishing, which is carried on almost to the exclusion of all other pursuits.

In 1884, some harbour improvements were commenced which were completed in 1887. The works consisted of two parallel piers; the west pier 75 feet long and the east pier 230 feet long.

During 1900-01, a breakwater was commenced at a point called 'Les Islets'. It is built of close faced cribwork with the following dimensions :—length on top, 160 feet with bridgeway approach to shore, over rocky ridge of 30 by 15 feet, built of 3-inch deals spiked on to beams or stringers. Length of structure at bottom, 150 feet; average width, 25 feet 9 inches; total height, at outer end to top of flooring, 16 feet; depth of water at outer end, low water spring tides,  $4\frac{1}{2}$  feet.

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On October 17, 1903, a contract was entered into with Messrs. Lyon and White for the construction of a 200 foot addition to the breakwater.

During the last fiscal year, 1904-05, 100 feet of the addition was built to high water level.

The expenditure during 1904-05, amounted to \$4,450.96.

#### NEW RICHMOND.

New Richmond, Bonaventure county, is situated on the Baie des Chaleurs, some 66 miles by rail from Métapédia, on the line of the Atlantic and Lake Superior railway.

It contains two churches, several schools, stores, saw-mills, shingle mills, one grist mill and one planing mill. It is one of the largest lumber manufacturing centres in the Baie des Chaleurs. A powerful company has been formed for the exploitation of the pulp industry, on the Little Cascapédia river. Large quantities of railway ties are manufactured and shipped to the United States.

Population, 2,500.

Spring tides rise  $6\frac{1}{2}$  feet.

On July 8, 1904, a contract was entered into for the construction of a landing pier, in the sum of \$14,400.

Work was commenced at once and the landing pier and approaches completed by the end of the fiscal year 1904-05.

The work, as completed, consists of a stone approach or embankment 15 feet long and 20 feet wide, with side and end slopes of 1 in 1; a cribwork abutment 20 by 20 feet, 19 cribwork piers, 20 by 20 feet, and an outer block, 100 feet long by 30 feet wide, placed at intervals of 20 feet and spanned with stringers.

It is built of continuous open face round timber cribwork filled with stone ballast.

The top of the flooring, at the outer end, is 5 feet 5 inches above high water spring tides.

The expenditure during the last fiscal year, amounted to \$13,245.37.

#### NOMININGUE.

Nominuingue, on the lake of the same name, is a post village in Labelle county and the terminus of the Canadian Pacific railway, Laurentian Mountains branch, twenty-three miles north of Labelle and 124 miles north-west of Montreal. It contains one Roman Catholic church, one convent, five hotels, saw and grist mills, several stores and a telegraph office.

During the fiscal year 1903-04, the construction by day labour of five wharfs, all of the same head dimensions, was commenced; two on Lake Grand Nominuingue, two on Lake Petit Nominuingue communicating with preceding by River Sawga, and one on Lake Bourget about one mile from the village.

The main object of these wharfs was to facilitate the transportation by water of passengers and general freight from the surrounding townships, thereby avoiding long distances through very bad roads.

They consist of a round timber open-faced cribwork block 31 feet 4 inches long, 21 feet 4 inches wide and 12 feet high standing in 5 feet of water.

The approaches are of different nature and dimensions as follows:—

At Corbin's, 13 feet wide and 148 feet long, of which 108 of stone and 40 feet crib and span.

At Rodier's, 13 feet wide, 120 feet long formed of three cribs and spans.

At Rivet's, 30 feet wide all stone with slopes 1 in 1 and 104 feet long.

At Labelle's, 13 feet wide and 58 feet long formed of one 20-foot span and 38 feet stone.

At Laroche's, 13 feet wide and 12 feet long span.

During 1903-04, the sum of \$2,017.22 was expended. During 1904-05, the wharfs were completed with a further outlay of \$2,137.20.

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## NOTRE-DAME DU PORTAGE.

On the south shore of the St. Lawrence, six miles west of Rivière du Loup, in the County of Temiscouata, is situated the village of Notre Dame du Portage, which, is resorted to by tourists in summer.

Spring tides rise 19 feet ; neaps, 12 feet.

To meet the requirements of the place, it was decided to build a wharf. Work was commenced in the month of September, 1904.

When completed, the new wharf will have a total length of 400 feet by a width of 20 feet together with a stone approach 50 feet long and an 'L' wing of 50 feet in length and 30 feet wide.

At the close of the fiscal year, about two-thirds of the work was done.

The expenditure during 1904-05, amounted to \$8,043.70.

## PASPÉBIAC.

Paspébiac, a seaport in Bonaventure county, is situated on the Baie des Chaleurs, sixty-eight miles south of Percé and eighty-five miles north of Campbellton.

The line of the Atlantic and Lake Superior railway extends as far as Paspébiac, where freight is delivered.

It is an important fishing station, it having been for over a century, the headquarters of the great fishing firm of Charles Robin & Co., of the Island of Jersey.

It contains two churches, one telegraph office, one hotel, several stores and two large establishments.

The population of the village is 1,000, mostly engaged in the fishing industry.

During the fiscal year 1903-04, a contract was entered into for the construction of a wharf at this place. Contract price, \$19,695.

The work under contract consisted of: a stone and earth approach, 30 feet wide on top and 50 feet long, with slopes of 1 in 1 ; a shore abutment, 20 feet long by 30 feet wide; three blocks, 20 by 30 feet; an outer block, 240 feet by 30, built of three separate cribs, 85, 85 and 70 respectively, all of close-face cribwork, filled with stone and sheathed with hardwood on the seaward side. The spaces between the abutments, piers and outer block are spanned over with 10-inch by 12-inch stringers. A landing slip, 70 feet long, is situated on the northern side of the outer block. The entire structure is covered with a 3-inch spruce flooring.

Total length of wharf, including approaches, 450 feet. Depth of water at outer end, 15 feet at low water spring tides. Top of flooring 5 feet above high water spring tides.

Spring tides rise  $7\frac{1}{2}$  feet.

At the close of the fiscal year of 1903-04, work had been done to the amount of \$5,705.82.

During 1904-05, the wharf was completed and the road leading thereto was built by day labour.

Expenditure during last fiscal year, \$16,641.24.

## PEEL HEAD BAY.

Peel Head Bay, in Missiquoi county, is at the head of Missiquoi bay, an arm of Lake Champlain, three miles from St. Sebastien, in Iberville county, and nine miles from Stanbridge on the Canadian Pacific railway.

The large traffic of hay besides coal and general merchandise carried on at Peel Head bay, made urgent the construction of the wharf in this locality. To that effect, a right of way of irregular form, of an area of 33,928 square feet and including an old stone wharf and new hay shed 60 feet by 40 feet was bought from Mr. Jamieson at a cost of \$1,500.

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It was the intention at first to build the head block of wharf, 96 feet long, 32 feet wide and 15 feet high, standing in 5 feet of water, of close-faced 12 x 12-inch spruce timber, but this was modified later, and a superstructure of 12 x 12 concrete members on the Fraser system was adopted from low water level. Work on the wharf proper had not yet begun in June last.

A stone approach 18 feet wide at top, for a length of 120 feet from head block, and 25 feet wide for a length of 295 feet to the public road, the whole with sides inclined 1 in 1 will be built. Expenditure during the year 1904-05 was \$1,758.34.

## PERCÉ.

Percé is the shiretown of the County of Gaspé, it is situated on the Gulf of St. Lawrence, thirty-six miles from Gaspé basin. It is one of the most important fishing stations on the coast of Gaspé, and its population numbers about 2,500.

A breakwater was constructed in the South Beach in 1888 and 1899.

During the last fiscal year the freight shed and waiting-room on the North Beach wharf, was completed. The wharf on the South Beach, which was badly damaged was repaired, the outer end, the north-east side and 50 feet of the south-west side were sheathed with spruce piles, driven 5 to 10 feet in the bottom and bolted to face-timbers. The work was done by day labour.

Spring tides rise 5 feet, neaps 3 feet.

The expenditure during 1904-05, amounted to \$2,068.95.

## PETITE PÉRIBONKA.

La Petite Péribonka, in the County of Chicoutimi is situated on the west side of La Grande Péribonka, near its mouth.

The pulp mill is situated at four miles above the Grande Péribonka.

During the fiscal year 1904-05, part of the snags and obstructions in the channel were removed. Amount expended, \$627.76.

## PETITES BERGERONNES.

Les Petites Bergeronnes, in the parish of Les Bergeronnes, is situated on the north shore of the St. Lawrence, fourteen miles below Tadousac.

There is an important saw-mill on the River Petite Bergeronnes.

The entrance to and the River Petite Bergeronnes being obstructed by boulders, work was done to clean the channel, up to the saw-mill.

Amount expended during the year 1903-04, \$904.71.

During the fiscal year 1904-05, the removal of boulders in Petite Bergeronnes was continued.

Amount expended, \$898.58.

Spring tides rise 16 feet, neaps 9 feet.

## PIERREVILLE.

Pierreville, a thriving post village in Yamaska county, on the River St. Francis, near its entrance into the St. Lawrence, 28½ miles north-west of Sorel, the actual terminus of the South Shore railway.

It contains one Roman Catholic church, 1 telegraph office, about a dozen stores, saw, grist and carding mills, and has a very extensive lumber trade. Buckskin gloves, mitts and shoes and baskets are made here in large quantities by a tribe of Abenakis Indians. Ship building is also engaged in. Population of the village, 1,108.

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By the fact that the private wharf at Pierreville is situated above the bridge of the South Shore railway and that barges and vessels cannot pass under the bridge, it was decided to build a public wharf immediately below it. A right of way, from the public road to the river, was purchased, part from Mr. Jos. Rasconi, of Pierreville, and part from the Abenakis Indians for the total sum of \$700.

On June 30, 1904, the work was not commenced, but materials had been procured for the sum of \$3,816.91.

Work on the wharf proper was commenced by day labour in September, 1904, and completed by the end of June, 1905.

The structure consists :—

1. Of a pile wharf, 150 feet long, 48 feet 4 inches wide, and 13 feet high, standing in 5 feet of water, with icebreaker inclined  $1\frac{1}{2}$  in 1 at its upstream end and double slip along the face.

2. Of an earth approach about 400 feet long, from 30 to 15 feet wide, with riprap slopes properly inclined on both sides.

3. Of a shed for storage purposes erected on stone pillars, near the approach.

Total expenditure during fiscal year was \$8,369.61.

## POINTE À ELIE.

Pointe à Elie is the extreme south easterly point of Allright island, 2 miles east of the House Harbour Catholic church.

The steamer 'Amelia' calls at Pointe à Elie for mails and freight, and for shelter during north easterly gales.

The construction of a landing pier and breakwater will give the best of shelter from all storms and especially from easterly gales that prevail in the spring.

During the fiscal year 1902-03, a length of 115 feet by  $22\frac{1}{2}$  feet wide of the pier proper was built; 850 feet of roadway, from 25 to 50 feet wide, and of an average height of 9 feet, was built of stone, with a timber facing held in place by walings, posts and cross-ties.

During the fiscal year 1903-04, 195 feet of cribwork was constructed  $24\frac{1}{2}$  feet wide.

During the last fiscal year a crib of 100 feet long by 26 feet wide was built and secured into position. Seven feet of the superstructure remains to be done.

The depth of water at the outer end of the work is 15 feet, at low water spring tides.

The expenditure during the last fiscal year is \$6,389.89.

Spring tides rise 4 feet; neap tides, 2 feet.

## POINTE AUX ESQUIMAUX.

Pointe aux Esquimaux, in the County of Saguenay, is situated on the northern shore of the River St. Lawrence, 525 miles below Quebec.

It is the chef lieu of that district of north shore and contains a Roman Catholic church, one convent, an hospital, three stores, telegraph and post offices. It is the most important fishing place on the north shore; its trade consists mostly of fur, fish and oil.

The wharf purchased by the department in 1895, had a length 125 feet and a head block of 30 feet.

In 1895-96, the wharf was lengthened 60 feet, by the construction of a block, 30 by 36 and 42 feet in height, connected with the old work by a platform 30 feet in length; the wharf is now 195 feet in length by 41 and 30 in width; the depth of water, at its outer end is 24 feet at low water. Amount expended, \$4,028.42.

During the year 1902-03, a block of 30 by 30 and 50 feet high in 41 feet of water, was built 15 feet from the wharf to which it is connected by stringers 8 by 10 inches, supporting a flooring of 3-inch red spruce.

Amount expended, \$1,633.78.

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During the year 1903-04, a pier of 30 by 30 was sunk alongside the one built the year previous. Amount expended, \$4,943.91.

During the fiscal year 1904-05, this pier was completed and the superstructure of the pier built in 1902-03 was raised and completed. The wharf is now 213 feet long, 30 to 40 feet wide, with an outer block 30 feet long by 68 feet and 50 feet high, where there is a depth of 40 feet of water, at low water spring tides. Spring tides rise 5 feet, neaps, 3 feet.

The shed, which was facing the wharf, was removed to the side and repaired. The sum expended was \$1,726.78.

## POINTE AUX TREMBLES.

Pointe aux Trembles, County of Portneuf, is a village on the north shore of the St. Lawrence, nineteen miles above Quebec, the nearest railway station is Pont Rouge, on the Canadian Pacific railway, distant three miles.

Population about 1,250. Spring tides rise 17 feet, neaps 10.

The opening of a road leading to the wharf was completed during the first two months of the fiscal year ended June 30 last. This road from public highway to the government wharf, under construction, has a length of 1,015 feet and from 30 to 36 feet wide; it is fenced on both sides, where not adjoining vendor's property, with strong round cedar posts and four strands of No. 9 galvanized wire; length of fencing 1,220 feet. There being a heavy down grade towards the wharf, the hill was cut down and about 1,000 feet of dry stone protection wall, averaging about 280 cubic yards of masonry were hand-laid; the roadbed has been well drained in the lower part of hill, well graded with broken stone and gravel.

In February, 1904, the department acquired, from Athanase Delisle, lot No. 87a, at Pointe aux Trembles, for the purpose of constructing a wharf thereon.

On June 28, 1904, a contract was entered into with Messrs. Dussault & Pageau, for the construction of a wharf, 550 feet long, 20 feet wide on top, except the outer 70 feet which will be 50 feet wide. The whole structure to be of close-faced cribwork, filled with stone ballast. The contract price was \$33,775.

During the last fiscal year, work under contract has progressed favourably, but owing to damages by ice, last spring, the wharf will not be completed as soon as expected.

The expenditure during 1904-05, is \$9,958.17.

## POINTE ST. PIERRE.

Pointe St. Pierre, County of Gaspé, is situated at the western entrance of Gaspé bay, twenty-one miles from Gaspé basin, and fifteen miles from Percé.

In order to afford shelter to fishing boats during the easterly winds, and provide deep water berths along the inner face for large schooners, the department decided to construct a wharf at this place.

In September, 1902, a contract was entered into with Messrs. Heney & Smith to build a wharf 420 feet long.

Three cribs, 100 feet each, have been built in position, the fourth crib, 77 feet long, is being built.

The expenditure during the fiscal year, 1904-05, amounted to \$380.

## POINTE VALOIS.

Pointe à Valois, County of Vaudreuil, is situated on the south shore of the Lake of Two Mountains, four and one-half miles west of the village of Vaudreuil and two and a half miles east of Comon.

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In 1889-90, the old pier at this place measuring about 80 feet by 16 feet, with head block of 45 feet by 20 feet and right of way thereto were purchased from Charles Valois, for the sum of \$890.

During the fiscal years 1890-91-92, the original pier was extended by adding, at the outer end, a block of ballasted cribwork, 135 feet long by 21 feet wide, with a return to the eastward 55 feet by 25 feet; the total length of the work from the shore being thus increased to 235 feet. The depth of water available at the outer end of the wharf is now  $6\frac{1}{2}$  feet at low water.

During the fiscal year 1896-97, a sum of \$210.72 was applied in effecting general repairs on this wharf.

In 1899, general repairs were made for a sum of \$104.97.

During fiscal year 1900-01, more extensive repairs were made consisting chiefly:

In the prolongation of the stone embankment for a distance of 90 feet; in the renewal of a number of stringers, of all the flooring, of part of the front sheathing and of the guard-railing, the whole at a cost of \$805.60.

During the spring of 1905, the head block and stone approach were slightly damaged by ice; they were immediately repaired at a cost of \$204.78.

The wharf was transferred to the Department of Marine and Fisheries in October, 1897.

## PORT DANIEL.

Port Daniel, Bonaventure county, is situated on the Baie des Chaleurs, forty-five miles south of Percé, and about seventy-five miles north of Campbellton. It is an important settlement of some 600 inhabitants mostly engaged in the fishing industry. It contains five churches, saw, grist and shingle mills, one fish cannery and two telegraph offices.

Spring tides rise 6 feet; neaps, 3 feet.

During the session of 1886, parliament granted an appropriation for the construction of a landing pier, at this place. The work was executed under contract and completed in 1889, at a cost of \$20,487.58.

The pier was then 350 feet long, 20 feet wide for the first 200 feet, 30 feet wide for the next 100 feet, with a block, 50 feet square and 26 feet high, forming the outer end, where a depth of 13 feet, L.W.O.S.T., could be found.

On November 15, 1889, a contract was entered into for the construction of an extension 75 feet long, 50 feet wide and 27 feet high; this work was completed in October, 1890, at a cost of \$12,586.44.

The pier had then a total length of 425 feet, built throughout of close-face cribwork.

In 1895, the extension, which had settled, was raised and repaired.

In 1897, the main body of the pier having also settled was raised and repaired.

Repairs were also made in 1898, 1899 and 1903.

During the fiscal year ended June 30, 1904, the sum of \$2,900 was expended in repairs and improvements; the work consisted in placing 200 feet of sheet-piling and refilling the pier, with ballast, where necessary. The hill, in the road leading to the pier, was also lowered.

On May 30, 1904, a contract was entered into for the construction of an extension 100 feet long, 50 feet wide, built of square timber close-faced cribwork, filled with stone and covered with 5-inch flooring.

Contract price, \$21,890.

During the last fiscal year, the substructure was sunk in place and built up to about 5 feet above low water level.

Stones and boulders, in the vicinity of the wharf, were also removed by day labour, at a cost of \$349.

Total expenditure during fiscal year 1904-05, \$11,013.88.



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## PORTNEUF.

Portneuf is a village in the County of Saguenay, situated on the north shore of River St. Lawrence, about fifty miles below Tadoussac.

There is an important saw-mill there, also three stores, one Roman Catholic church, telegraph and post offices.

During the session of parliament of 1904, the sum of \$1,000 was voted for the construction of a wharf in the Bay of Portneuf.

Work was commenced and a pier, 40 feet by 20 feet was sunk in 7 feet of water.

The wharf, when completed, will be 140 feet in length, built of two piers and abutments.

The outer pier will be in the form of an 'L' 40 feet in length by 20 feet and 40 feet in width; the centre pier 20 by 20, the abutment 30 by 20, with spaces of 25 feet between the abutment and each pier.

Spring tides rise 12 feet; neaps, 9 feet.

The expenditure during the fiscal year 1904-05, was \$1,000.

## QUEBEC HARBOUR.

In order to afford more accommodation for large ocean steamers, to land immigrants and general freight, in the harbour of Quebec, the department decided, in 1902, to build an extension in a northerly direction to the breakwater, built many years ago, on the river front of the harbour.

On May 8, 1903, after calling for tenders a contract was awarded to Messrs. Dusault and Lemieux, of Lévis, for the construction of 462 feet of the work, and on June 11, 1904, another contract was signed for an additional length of 500 feet of the extension and of the same class of work as specified in the first contract, the prices in each case being \$198,700 and \$239,942.87; construction was commenced in May, 1903.

From the bottom up to 3 feet above low water spring tides, the extension consists of timber cribwork, 46 feet wide at base and 21 feet wide at top, filled with stone ballast, the cribs are founded on a bed of rubble stone 4 feet in thickness, deposited on the sand bottom, previously dredged to a depth of 46 feet at low water spring tides, leaving an available depth of 42 feet at the outer face of the cribs. From 3 feet above low water, for a height of 21 feet, the superstructure is built of concrete, and stands 6 feet above high water spring tides.

The back of the cribs and concrete superstructure will be filled with dredged materials, forming an embankment, which will increase the available top area by 290,000 superficial feet.

At the end of the fiscal year 1903-04, three cribs forming the length of 462 feet had been built, ready to be sunk, the dredging for the foundation had been completed on the whole length of 962 feet, the rubble stone bed for the cribs was built for a length of 300 feet, and 45,000 cubic yards of filling deposited; the amount paid on work done at the end of that year was \$87,238.

During the fiscal year 1904-05, four cribs, forming a length of 645 feet, were sunk in place, the concrete superstructure was built, to the required height, on a length of 462 feet, and 80,000 cubic yards of material deposited as back filling. The amount expended during the fiscal year 1904-05 was \$149,990.67, and the total amount expended was \$237,228.67.

The two last cribs, completing the total length of 962 feet of extension under contract, have since been sunk in place.

## REPENTIGNY.

Repentigny is a post village in L'Assomption county, on the St. Lawrence, two miles from St. Paul l'Ermite, on the Great Northern, and seventeen miles north-east of Montreal. It contains two stores, one hotel and one church. Population, 600.

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On August 10, 1904, a contract was entered into with Lachance Brothers, of Ottawa, for the construction of a wharf opposite the Juneau property, about four-fifth of a mile from the village, at a price of \$10,975. It called for the building : 1. Of a close-faced crib head block 73 feet 6 inches long by 40 feet wide and standing 19 feet high in 7 feet 3 inches of water; 2. Of a close-faced crib approach adjoining head block of a length of 230 feet and a width of 16 feet; 3. Of a stone approach 435 feet long and 18 feet wide at top with slopes of 1 in 1 on both sides; the whole forming a length of 705 feet.

In order to place the proposed wharf as near as possible to the centre of the village, a change of site was decided on and that opposite Telephore Thouin's property chosen, thereby lengthening the stone approach from 435 to 748 feet and the whole structure from 705 to 1,018 feet without modifying in any way its other dimensions. A further arrangement was made in December with the contractors, whereby they agreed to the change at an extra cost of \$5,039, above original contract price.

A right of way, 820 feet long and 50 feet wide, was bought from Mr. Thouin at a cost of \$100.

Work was begun early in January and suspended on account of high water at the end of March. The stone approach was then two-third completed and the cribwork approach built to a mean height of 6 feet and fully ballasted. Expenditure during 1904-05, was \$6,498.95.

## RIMOUSKI.

The town of Rimouski, in the county of the same name, is situated on the south shore of the River St. Lawrence, 180 miles below Quebec; its population is about 2,000. It is an important station of the Intercolonial railway, and the place where the royal mails are transferred from steamers to the railway.

Spring tides rise 18 feet, neap  $9\frac{1}{2}$  feet.

Owing to the worm-eaten condition of the east side of the wharf also to widen the structure, which has a railway track thereon and was only 20 feet wide, it was decided to construct additional cribwork, along the east side of the wharf, on a length of 900 feet, 20 feet wide at the bottom, 15 feet wide at the top, built to the height of the present wharf.

The works were commenced on May 1, 1904, and up to June 30 of the same year, five cribs, forming a length of 526 feet were sunk and the slip, on the west side of the wharf, was rebuilt on a length of 150 feet and a height of 8 feet. A large quantity of materials was bought for the continuation of the work. The expenditure for that year was \$27,236.75.

The works were resumed on July 1 of the fiscal year ended June 30, 1905. Four additional cribs were sunk, giving a total length, with the former ones, of 900 feet, the whole length was then built up to the level of the old wharf. The face-timbers of those cribs are round logs, 27 feet long; their upper and lower faces are notched every 8 feet to a thickness of 10 inches with parallel faces to receive the flatted ends of the cross-ties.

The cross-ties are round timbers of sufficient length to reach from side to side of the work, and laid 8 feet apart. Spruce is used throughout the work, except a depth of 4 feet on the superstructure, which is of cedar.

On the seaward face of the new cribwork was placed an elm sheet piling, 6 inches thick, driven into the bottom a mean depth of 8 feet.

Besides the new work, the flooring, stringers and a row of cross-ties and longitudinal timbers were renewed on a length of 900 feet on the old wharf, near the new work; the face of the slip on the west side of the wharf, 205 feet long, was also sheathed with hardwood 6 inches thick.

In order to afford a suitable foundation for the construction of a train guard, near the outer end, the superstructure on a length of 175 feet, a width of 26 feet and a depth of 10 feet had to be renewed.

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Lastly, the flooring and stringers, on a length of 100 feet and a width of 30 feet on the east wing of the outer end, was raised and renewed.

A good quantity of materials is still available for further works.

These works were performed by day labour and the expenditure for the fiscal year 1904-05, is \$26,576.49.

#### RIVIÈRE À LA PIPE CR ST. HENRI DE TAILLON.

Rivière à la Pipe is a small village situated on the north shore of Lake St. John, at the mouth of the river of the same name, seven miles north of Grande Décharge; it contains a Roman Catholic church, two saw-mills, a post office, two factories and several stores.

The wharf is situated at a point on lot No. 118, Township Taillon, about one mile to the westward of Rivière à la Pipe. It is built in a southerly direction, about 75 feet from shore, for a length of 200 feet and a width of 25 feet, and extends to 8 feet water at the mean summer level of Lake St. John.

It is built of close-faced cribwork up to 18 feet, during the year 1897-98, and will stand 25 feet high when completed.

The Quebec government has built a good road from the public road to the present wharf, a distance of two miles.

During the year 1899, an addition of 50 feet long by 30 feet wide was built, at the outer end of the wharf, to facilitate the approach.

During the year 1899 the outer block was raised 5 feet, sheathed for a length 120 feet and replanked; 25 toises of stone were also placed in the work, at a total cost of \$999.68.

During the fiscal year 1904-05, a certain quantity of timber was bought in view of the extension of the wharf.

The outside pier was unloaded in view of removing that pier, which is 40 x 25 feet, to form the outer end of the proposed extension.

The total expenditure during the last fiscal year was \$961.80.

#### RIVIÈRE AU RENARD.

Rivière au Renard is one of the most ancient settlements in the county of Gaspé.

It is the first important fishing station and business place met with, proceeding from Gaspé basin, along the south shore up the St. Lawrence.

The population is estimated at 1,700.

A small pier was constructed in 1895-96. In 1899-1900, the sum of \$2,870.51 was expended for materials towards the construction of a landing pier and breakwater.

During the fiscal year 1900-01, the sum of \$2,013.36 was expended in purchasing additional timber. Work has started in May, and on June 30, 190 feet of close-face cribwork, 5½ feet high 28 feet wide at bottom and fully ballasted was in place.

On June 2, 1903, a contract was entered into for the construction of an additional length of 600 feet.

During the last fiscal year, 480 feet of the 600 contracted for were built.

The expenditure during 1904-05, amounted to \$19,990.15.

#### RIVIÈRE DES VASES.

Rivière des Vases is in the County of Temiscouata, 125 miles below Quebec and six miles west of Ile Verte.

The sea grass industry, which is the chief trade of the place, having become increased, and to provide better landing accommodation for the people living on the island opposite, the construction of an open cribwork pier was begun, along the eastern bank of the river.

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From the year 1900 to June 30, 1903, a length of 167 feet 30 feet wide and 8 feet high, along the outer face, was built at a cost of \$1,506.66.

During the fiscal year ended June 30, 1905, a further addition 50 feet long, of same height and width, was constructed at an expenditure of \$790.18.

The work is built of open-faced cribwork filled with stone.

## RIVIÈRE DU LOUP.

Rivière du Loup, or the town of Fraserville, is the chef-lieu of the County of Témiscouata. It is situated on the south shore of the St. Lawrence, 114 miles below Quebec. It is a thriving little town of nearly 4,000 inhabitants, which contains several manufacturies, including the pulp mills.

The Rivière du Loup point, where the wharf is located, is distant two miles from the town. It is one of the best known and most frequented summer resorts of the St. Lawrence.

Spring tides rise 19 feet; neap tides, 12 feet.

Owing to the action of the ice and waves, also the considerable wear and tear due to a heavy lumber traffic, annual repairs are required to the wharf.

During the fiscal year ended June 30, 1905, the following works were performed : The outer face being much exposed to the pressure of the ice, the sheathing and face timbers were badly broken near the low water mark; two holes in the face timbers, each about 30 by 8 feet through which the ballast went out, were closed and covered with an elm sheathing 6 inches thick. The worst portions of the old sheathing, were renewed upon a surface of 1,800 square feet with 6-inch thick elm; the covering of the north-east corner was repaired with elm 8 inches thick. A surface of 10,400 square feet on the west face, was sheathed with spruce 5 inches in thickness, the face timber being much worn by the ice and by the scows carrying timber to load steamers.

Some 800 spruce deals, 1-inch thick, were used to repair the top planking, and two ladders, 26 feet long, of elm 6 x 9 inches, were placed where needed. Lastly, the stairway on the west side of the wharf, was thoroughly repaired.

About 10,000 lineal feet of spruce, paid for, are available for further works.

The work was done by day labour, at a cost of \$13,395.42.

## RIVIÈRE OUELLE.

The Rivière Ouelle wharf is situated at Pointe aux Orignaux, five miles from the village of Rivière Ouelle, in the County of Kamouraska, on the south shore of the St. Lawrence, opposite Murray Bay on the north shore.

A branch of the Intercolonial railway, built from Rivière Ouelle station to the outer end of the wharf, runs trains connecting with the steamer which crosses the St. Lawrence several times a day during the summer season, calling at Murray Bay and other places on the north shore; in winter time, with few exceptions, this steamer makes daily trips between Rivière Ouelle and Murray Bay, carrying mails and passengers.

Spring tides rise 20 feet; neaps, 12 feet.

In the course of the fiscal year ended June 30, 1905, the outer face of the 'T' head of the wharf, which is 238 feet in length, was sheathed with elm 6 and 8 inches in thickness. The two outside corner angles were covered with iron plates 13-16-inch thick, and the sheathing of the side faces, of the main body of the wharf, was also repaired.

Temporary repairs were made to the slip on the east side of the wharf, so as to prevent the work from further damage during winter; the stairway, on the west side, was also repaired.

The work was done by day labour at a cost of \$2,981.68.

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## RIVIÈRE VERTE (GREEN RIVER).

Rivière Verte which flows through the parish of Ile Verte empties into the St. Lawrence about half a mile west of the church.

During the spring freshets, this river is liable to cause considerable damage by flooding the mills, scouring and disintegrating the riparian properties.

The protection works begun last year were continued during the fiscal year ended June 30, 1905 ; a second cribwork dike was commenced and a length of 275 feet constructed ; the dike has a width of 20 and 10 feet at top and base respectively, and a mean height of 10 feet. The back is plumb and the front side or apron is inclined 1 in 1.

A large quantity of timber, paid for, was left on the site of the work

The dike was thoroughly filled with stone.

The object of this dike, when completed, will be to divert the current from the side to the middle channel, when this latter will have been widened and deepened.

The expenditure during the fiscal year has been \$5,499.61.

## RIVER NICOLET.

River Nicolet rises in Lake Nicolet, Wolfe county, and falls into Lake St. Peter, 3 miles below Nicolet, in Nicolet county. It is a rapid stream, but navigable to some distance above the village.

In order to protect the schooners loading in the harbour against storms on Lake St. Peter, a jetty was commenced in 1881, and added to every successive year. It was originally 3,500 feet long, made of two rows of close piles 13 feet distant, and filled with stone. It stood 4 feet above low water with an average height of 5½ feet.

In 1891, some piling was done making the jetty 3,762 feet long.

Dredging in the river and repairs to the jetty were done yearly as follows :—

Year 1852 to June 30, 1900, construction, repairs and dredging. . . . .	\$148,780 54
Year 1900-01 dredging and repairs. . . . .	7,489 19
“ 1901-02 “ . . . . .	4,795 88
“ 1902-03 dredging. . . . .	3,999 27
“ 1903-04 “ . . . . .	11,723 81
“ 1904-05 construction, repairs, dredging. . . . .	10,320 53

Total to June 30, 1905. . . . . \$187,109 22

Out of the expenditure of 1904-05, a small wharf was built, during February and March along the river, about 1½ mile from Nicolet and opposite the old Ball mills. It was made of a close faced stone filled crib block, 80 feet long including icebreaker, inclined 1½ in 1 and 31 feet wide. It will be of great utility to the Nicolet trade, as this point is the nearest to the village and boats of 6 feet draught can reach there safely. A right of way to the wharf, 250 feet long and 80 feet wide, was purchased from Mr. C. Proulx, at a cost of \$400. Total expenditure during fiscal year 1904-05, \$10,320.53.

## RIVER ST. LOUIS IMPROVEMENTS.

St. Louis de Gonzague is a post village in Beauharnois county, on the Grand Trunk Railway, ten miles from Beauharnois and thirty-five miles south-west of Montreal. It contains one church, one convent, one grist-mill, two hotels and four stores. Population, 1,200.

During the spring freshets, the River St. Louis spreads over the farming lands, from the canal feeder to the village of St. Louis de Gonzague, a distance of about seven miles, and thus causes considerable damage. During the summer, the river

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often overflows equally after a heavy rain-storm, and extensive fields of promising crops have been entirely lost.

Surveys of the river were made in November, 1903 and October, 1904. It was found that from the village of St. Louis de Gonzague to a distance of two and one-half miles upstream, several little rapids give a total fall of 6 feet. Above the canal feeder, the fall is about 1 foot per mile.

By proper deepening of the river bed and straightening of certain curves, the water could be lowered some 4 feet which would be amply sufficient to protect the farmers along the banks.

To this effect, a small dredge was built during the winter of 1903-04, and placed in operation in October, 1904. At the end of June, 1905, a cut had been made through the point known as Simmon's. A 28-foot long and 12-foot wide steel span, composed of four 15-inch 42-lb. I-beams with 8-inch channel connections, had been erected in order not to interfere with the roadway; and the necessary dynamiting and dredging done through hard pan and large boulders up to half way through the lower rapid, about 1,000 feet from Simmon's mill.

The total expenditure, 1904-05, including dredge operating staff, but exclusive of cost of dredge, was \$5,719.19.

## RIVER ST. LOUIS FEEDERS.

During October, November and December, 1904, an extensive survey was made for the localization of a drainage canal proposed to be dredged from River Laguerre, near St. Anicet, through St. Barbe parish, both in the County of Huntingdon, to River St. Louis, near St. Stanislas, in the County of Beauharnois, some seven miles south of Valleyfield.

In order to give more water to the Beauharnois canal, the government, about 1865, built two dams in Lake St. Francis, one from the shore to La Grande Ile, the other from the far side of La Grande Ile to Ile aux Chats, at the head of the rapids. This had the effect of raising the lake some 4 feet, thereby causing, along the shores, heavy damages which have since been paid by the government, but also forcing back in the spring the flow of River Laguerre, which now spreads over the surrounding low lands and renders some 20,000 acres absolutely valueless.

The object of the proposed canal is to divert this overflow to River St. Louis, some ten miles north. No action, outside of the above, was taken during present fiscal year. Expenditure for survey 1904-05, was \$548.29.

A preliminary survey had been made in 1901-02.

## RUISSEAU LEBLANC.

Ruisseau LeBlanc is a small village on the northern coast of Baie des Chaleurs, in the County of Bonaventure; the village is built near the mouth of the river, also called Ruisseau LeBlanc.

In order to protect the entrance to the river and afford shelter to fishing boats, it was decided to build a breakwater wharf, on the west side of the mouth of the river. On March 20, 1902, a contract was entered into for the construction of such breakwater. Work was completed in November of the same year, at a cost of \$21,077.29.

The structure is 500 feet long and 20 feet wide, substantially built of close-face cribwork, filled with stone.

The outer end stands in 7 feet at L.W.S.T., the top is  $7\frac{1}{2}$  feet above H.W.S.T. Spring tides rise 8 feet.

During the fiscal year 1904-05, the sum of \$300 was expended in repairs.



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## SAULT MONTMORENCY.

Sault Montmorency is situated eight miles below Quebec.

During the last fiscal year a cribwork revetment wall was built to protect the public road from the erosion caused by the heavy seas at spring tide.

This crib has a height of 8 feet by a depth of 10 feet, and covers a length of 600 feet. To complete this work 600 feet more of cribwork will be required, and should be built during next year.

The expenditure for the fiscal year 1904-05, amounts to \$6,508.82.

## SHIGAWAKE.

Shigawake, a post village in Bonaventure county, is situated on the Baie des Chaleurs, some eight miles north of Paspébiac. It contains two churches, one hotel, one telegraph office, saw and grist mills and six stores. Population about 500.

In 1903, the department decided to construct a wharf at this place and parliament granted an appropriation for that purpose.

On November 21, 1903, Mr. François Skene made a free grant to the Crown of the land required, some 5,000 square feet.

During the fiscal year 1903-04, the sum of \$2,818.02 was expended in procuring materials required for the construction of the wharf, which is to be built by day labour.

During the last fiscal year 1904-05, the work of construction was commenced.

The amount expended during the year, is \$1,781.46.

## SOREL.

Sorel, an incorporated city, is situated on the Richelieu river at its mouth in Lake St. Pierre. It is distant forty-five miles from Montreal by rail. Population about 7,000.

In June, 1901, a contract was entered into with Messrs. McAuliff, Poupore, Malone and Weddell, for the construction of a deep water wharf at this place. The contract price was \$255,632.43.

Work was commenced at once and in 1901-02, the expenditure amounted to \$94,612.37; in 1902-03, to \$132,661.81; in 1903-04, to \$44,224.75.

During the summer of 1904, the earth filling was levelled off, and a broken stone revetment was laid over almost the entire surface; the planking, along the edge of the wharf, was also laid as well as the cast iron mooring posts, along the Richelieu side of the wharf.

In the months of November and December, additional stone riprap was deposited, at the north-east inner angle of the wharf, as protection against waves in high gales. The quantity was 450 cubic yards.

In April, 1905, the 6,000 square yards of stone surfacing, required to complete the work, were laid and rolled, some earth filling was also deposited in the triangular space at the end of new wharf, adjoining the Richelieu Company wharf.

The above made the work complete according to specifications.

In April and May, 1905, a survey of the shore line of the St. Lawrence, along the town of Sorel, was made and a plan and estimate prepared, in view of further work to provide approaches to the new wharf.

Total expenditure during last fiscal year amounted to \$435.30.

## SOREL, ICE PIERS.

Sorel is an incorporated city, the capital of Richelieu county, situated on the right bank of the River Richelieu, at its mouth in Lake St. Peter, some forty-five miles north-east of Montreal. It contains waterworks, court of justice, prison, two



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markets, manufactories of engines, mill machinery, stoves, ploughs, leather, bricks, &c., several saw and grist mills, one printing office issuing semi-weekly newspapers, two branch banks, several hotels, two churches, telegraph and express offices and a number of stores. Shipbuilding, for which there are excellent facilities, is largely engaged in. Population, 7,057.

The River Richelieu is about eighty miles in length, and flows from Lake Champlain in a northerly direction through the counties of St. John and Iberville, Chambly, St. Hyacinthe and Richelieu, joining the St. Lawrence at Sorel at the head of Lake St. Peter.

With a view of protecting the properties on both sides of the river near its outlet at Sorel, and the boats which winter here against disastrous ice shoves from the St. Lawrence and the run of ice in the Richelieu during spring, five ice breaking piers were built in the bed of this stream between 1888 and 1892, two of which are on the west side of the last-named river near its confluence with the St. Lawrence.

All these piers have proved of good service, preventing the destruction of much valuable property.

The two piers at the mouth of the Richelieu measure 30 feet by 24 feet and are some 20 feet high; the top being about level with extreme high water on the St. Lawrence. They are well calculated to resist a great pressure from the St. Lawrence but were, at the time of their construction, insufficiently protected from the run of the Richelieu ice, and for this reason were considerably damaged chiefly in the spring of 1896.

During the fiscal year 1896-97, a sum of \$441.53 was applied in making good the damage done and strengthening the works by means of sheathing, bracing, corner plates, &c.

During 1898-99 the three ice-breakers above the South Shore Railway bridge were repaired. The top courses of timber, which were found damaged, were removed and renewed and the sheathing repaired. Cost, \$555.93.

Since, large sums were expended in construction and general repairs :

In 1900-01...	\$ 8,111 66
1901-02.....	1,990 83
1903-04.....	2,280 59

From October, 1904 to the end of March, 1905, the two ice-breakers near St. Joseph de Sorel, were razed to low water and rebuilt up to 15 feet above E.L.W.L., and entirely filled with stone at a cost of \$6,016.89.

## STE. ADELAIDE DE PABOS.

Ste. Adelaide de Pabos, commonly called Little Pabos, is an important parish in the County of Gaspé.

In 1888, in order to afford shelter to the fishing boats of the locality, a breakwater was built 200 feet long, 24 feet wide at bottom and the top of the seaward face sloping 1 in 1 on a height of 6 feet, leaving the top of the breakwater 18 feet wide.

In order to prevent the heavy seas from rolling over the breakwater the top was remodelled during the fiscal year 1902-03.

The work consisted in removing the sloping-face on the seaward side, and building instead a perpendicular wall 12 feet wide, from the level of the foot of the old slope on the total length of 200 feet and 9 feet high, or 3 feet higher than the original top; the top of the new work was planked over with 6-inch spruce deals.

During the latter part of the fiscal year the material was bought to build an additional crib of 100 feet, and during the month of June the crib was built 7 feet high and placed in position.

The expenditure during the fiscal year of 1904-05, was \$1,326.78.

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## ST. ALEXIS DE GRANDE BAIE.

St. Alexis de Grande Baie is on the south shore of Ha, Ha Bay, on River Saguenay, about sixty-three miles from its mouth. In order to accommodate the increasing traffic of the locality and provide landing facilities for steamers plying on the river Saguenay, the sum of \$4,000 was appropriated, at the session of parliament of 1898, for the construction of an isolated block. The pier is 15 feet long, 25 feet wide and 27 feet high, the outer end is at a distance of 1,446 feet from high water mark spring tides.

1899-1900, two blocks, one 80 feet long and the other 68 feet, were built from the shore with the view of connecting the outer block, those blocks are 25 feet wide and 20 feet high at the outer end.

Expenditure, \$3,999.

In 1900-01, an addition 250 feet long and 25 feet wide was built at a cost of \$4,016.63.

During the year 1901-02, three cribs, 25 feet long, 25 feet wide, filled with stone, were constructed at 25 feet south of the work commenced in 1898, those cribs are at a distance of 25 feet apart and are 21, 22, 23 feet respectively in height.

Expenditure, \$4,000.01.

During the year 1902-03, an extension was built to the shore wharf 150 feet long, 25 feet wide and 21 feet high at the outer end. The work is open-faced cribwork, built of 11 by 11-inch square-faced timber, with fenders at every 10 feet. The flooring is of 3-inch red spruce. The whole is filled with stone.

Expenditure, \$3,994 71.

During the year 1903-04, five piers placed 25 feet apart were built; the first one next to the old work is 20 x 35 feet with a landing slip; the four others are 20 x 25 feet. Part of the extension built the year previous was completed with stringers and flooring.

The span and the top of the first pier were also completed, the stringers are 10 x 12 inches; the four other piers are ready to receive the corbels and stringers. The piers are filled with stone.

Expenditure, \$4,082.35.

On January 4, 1905, a contract was entered into for the completion of the wharf. Work was commenced and eleven piers were sunk, nine of 20 x 25 feet and two of 25 x 30 feet, the work is still progressing.

Spring tides rise 17 feet, neaps 9 feet.

The expenditure during 1904-05, is \$5,627.23.

## ST. ALPHONSE DE BAGOTVILLE.

St. Alphonse de Bagotville is situated at the head of Ha Ha bay, on the southern side of the River Saguenay, sixty-six miles from its mouth.

A landing pier was built prior to confederation by the parochial authorities, at a cost of about \$3,200.

In 1876, an arm was built by the department on south side of this pier, 53 feet long by 26 feet wide, at a cost of \$3,084.34.

In 1881, the pier was strengthened and repaired, at a cost of \$3,897.20.

During the year 1881-82, three hundred and seventy-eight feet of the original pier, which had been burnt down to low water level at the shore, was rebuilt for an average height of 10 feet, a large portion of the flooring was renewed, and other repairs made at a cost of \$2,204.59.

In 1882-83, a block of cribwork was sunk close to the pier and filled with stone.

Expenditure, \$4,307.40.

During the year of 1883-84, the block was completed at the cost of \$3,586.03.

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In 1884-85, the work executed consisted in raising the wharf two and three feet over its length; constructing a movable slip and erecting an open shed, 80 x 66, on the outer end of the wharf.

Expenditure, \$4,680.55.

In 1887-88, the flooring of the wharf was repaired at a cost of \$216.98.

In 1889-90, the flooring of the wharf was renewed for 300 feet and a slip was built.

Expenditure, \$1,025.54.

In 1889-90, the flooring of the end of the wharf was renewed and other repairs made at a cost of \$809.27.

During the year 1890-91, the planking of the wharf was renewed over the western 200 feet and a quantity of stone ballast put in.

Expenditure, \$1,000.

In 1893-94, the work executed consisted in sheathing a length of 360 feet with 6-inch red spruce.

Expenditure, \$1,200.

During the year 1896-97, a shed 30 by 45 feet was built on the eastern side of the pier, the face timber on the slip was renewed.

Expenditure, \$497.78.

In 1898-99, the planking and stringers were completed on a length of 275 feet, and the north-east side of the pier was sheathed with 5-inch tamarack, over a length of 275 feet.

Expenditure, \$3,000.57.

In 1899-1900, the north and south sides of the pier, for a distance of 250 feet were sheathed with 5-inch tamarack, and the planking was renewed over the same length at a cost of \$548.

In 1902-03, general repairs were made to the flooring, the shed, and new fenders were put on. The shed was recovered with sheet iron.

Expenditure, \$1,500.

During the year 1903-04, a pier was built, 30 x 30 feet, on the west side of the wharf, with a slip. This pier is built of open-face timber, sheathed with 3-inch planks, and with fenders of 8 x 10 inches every 8 feet. It is ballasted and complete.

The covering of the shed in sheet iron was completed; a new waiting room, freight and cheese cold storage were made under the covered shed, the repairs to flooring were commenced and the shed was painted.

Amount expended, \$2,449.21.

During the fiscal year 1904-05, the work done consisted in general repairs, stringers, planking, sheathing and fenders.

Amount expended, \$1,912.42.

The wharf is 436 feet in length, 25 and 54 feet in width with an outer block of 40 feet by 85 feet. The depth of water at the outer end, is 18 feet.

Spring tides rise 17 feet; neaps, 9 feet.

## ST. ANDRÉ.

The village of St. André, in the County of Kamouraska, is situated on the south shore of the St. Lawrence, about fifteen miles west of Rivière du Loup and 100 miles below Quebec.

The place is somewhat frequented as a summer resort; it contains a foundry and an important machine factory.

Spring tides rise 19 feet; neaps, 12 feet.

The wharf owned by this department at St. André consists of an eastern embankment 850 feet long and 6 feet high, and nine piers connected by spans of 30 feet.

In the month of June, 1904, an addition to the wharf, 80 feet long, 86 feet wide and 18 feet high, was commenced.

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During the fiscal year ended June 30, 1905, the work which was close-faced, filled with stone, was completed. The earthen approach to the wharf was repaired upon a length of 200 feet thus completing the repairs to the whole embankment.

Two openings, 25 feet wide, between the outer piers of the wharf and which were most troublesome to, laying alongside, the wharf, have been closed.

The expenditure during the year 1904-05, amounted to \$2,460.46.

#### STE. ANNE DE LA PERADE.

Ste Anne de la Perade is a post village in Champlain county, on the C.P.R. 6 miles from Batiscan and 53 miles above Quebec. The River Ste. Annes, one of the tributaries of the St. Lawrence, divides the village.

A landslide in 1894, caused a complete change of some of the physical features of the Ste. Annes river. It is now a rapid stream carrying from the valley, where the crumbling took place, at St. Alban in Portneuf county, quantities of sand and of fine clay in suspension. The deposit of this material takes place near the mouth of the river, where the current slackens, thereby filling its natural bed, opposite the town, with quicksand shoals. During freshets these sand banks turn the current against the shores.

Just above the town, the west bank is high and unstable. Protection works, consisting of five dams constructed of double rows of open piling 10 feet apart and filled with alternate tiers of brush and stone, were constructed with a view of deflecting the current from the bank. This was only partly successful; the space behind the wings did not fill up permanently, the ballast and brush settled in the sand or was washed away, and some of the piling resting entirely in the quicksand, failed. The dykes were : No. 1, 140 feet ; No. 2, 340 feet ; No. 3, 435 feet long ; that in the little channel, on the west side of the river, 550 feet and the 5th near the C.P.R. bridge, 340 feet long.

A sum of \$14,906.05, out of which \$5,000 had been subscribed by the municipality, was thus expended.

During the fall of 1895, some trees, stumps, &c., which had accumulated in the little channel, were removed.

During the winter of 1896, dyke No. 1 was reconstructed for a length of 220 feet and No. 5 repaired. Long alders were used instead of balsam branches. Between each course of brush and ballast, round logs were inserted to hold the stone in place and to make the work more continuous. Where the pile work was gone and to renew connection with the shore, rough cribs or mattresses were made of long branches and logs heavily coursed with stone. Expenditure incurred was \$3,003.83.

During November, December and January, 1900-01, some repairs were made to dykes 1 and 4, and a round timber cribwork with an underbed of brush, the whole loaded with stone, was constructed for a length of 400 feet by a width of 10 feet and a height of 8 feet, from the foot of dyke No. 1 to the shore. The object of that work was to protect dykes No. 1 and 4, which menaced to be carried away, or at least seriously damaged by freshets, owing to a washout from the foot of dyke No. 1 to the shore, some 60 feet. Cost, \$1,199.21.

During the fiscal year 1901-02, the sum of \$2,997.17 was expended : \$2,090.23 to pay the balance due on the work carried out during the previous year, and \$906.94 to procure stone to riprap a portion of the west side of the west channel, from the C.P.R. bridge to the municipality bridge, to protect that part of the village against probable landslides caused by the increased quantity of water, now passing through that channel.

In 1903, minor repairs cost \$48.

During 1903-04, some riprapping was done : a dry stone dyke 10 feet wide at the base, 4 feet at top and 4 feet high being built for a distance of 900 feet. The dyke

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that had been erected at the head of St. Ignace channel being found an inconvenience to the shore owners, who take their supply of water there, a culvert 3 feet wide and 5 feet high was made at the bottom of said dyke. A sum of \$3,000 was thus expended.

In 1904-05, general repairs were made to all the protection works, and stone placed at the most threatened places. Cost, \$1,997.77.

## STE. ANNE DE LA POCATIÈRE.

The village of Ste. Anne de la Pocatière, in the County of Kamouraska, is situated on the south shore of the St. Lawrence, seventy-four miles below Quebec.

Spring tides rise 20 feet; neaps, 12 feet.

The reconstruction of the wharf begun in 1904, was continued and completed during the fiscal year 1904-05. This wharf had been broken and carried away by an ice shove, two years ago; it consisted of 12 piers, connected by spans; the piers were formerly built open faced, with flat timber 9 inches thick, their dimensions were only 20 by 20 feet. This time, the piers were 20 by 30 feet built close faced, with square timber 11 by 12 inches, and thoroughly filled with stone ballast.

Two openings, at the outer end of the wharf, were closed, and the corners of all the piers were sheathed with spruce 6 inches thick. A stairway was built on the east side, near the outer end.

The approach, constructed of stone which had been scattered about by the waves, was rebuilt with cedar filled with stone and earth.

The reconstruction was completed by the end of November, 1904, and the work is more strongly built than formerly.

The work was done by day labour at a cost of \$4,582.42.

## STE. ANNE DES MONTS.

The Ste. Anne river flows into the St. Lawrence, at the west end of the village of Ste. Anne des Monts, one of the oldest and most important establishment of the Gaspé Peninsula, some one hundred miles below the nearest railway station, Little Metis.

During the last fiscal year, timber was purchased for the construction of works, to improve the entrance to the river.

The expenditure during 1904-05, amounted to \$1,820.67.

## STE. ANNE DE SOREL.

The village of Ste. Anne de Sorel, in the County of Richelieu, is situated at the head of Lake St. Peter, on the south shore of the St. Lawrence, 2 miles below the town of Sorel.

During the spring freshets of the St. Lawrence, considerable portions of the parish of Ste. Anne, and of the island opposite, are flooded. In order to prevent the ice from being carried by the floods over the low lying lands along the shore, ice piers were built from 1881 to date at or in the vicinity of the village.

Construction.—The two first ice piers were built in 1881-82, in the Chenal du Moine, one of the channels of the St. Lawrence, and about two miles below the village of Ste. Anne. They were 30 feet square and fully answered the purpose for which they were built. Their total cost was \$1,957.97. At the end of the year 1882-83, the construction of two additional piers was commenced in the same channel. They were completed during the winter of 1883-84 at a cost of \$3,536.38. Another pier was built in 1885 at the head of Chenal du Moine, at a cost of \$1,176.53, and repairs amounting to \$7.20 effected to the piers built in 1884. A sixth pier was built in 1886 at a cost of \$1,321.86, which amount also included the cost of repairs effected to the piers built in 1884. In order to afford further protection, a seventh pier was built in 1887, a short

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distance below the one built in 1885. Its cost was \$836.66. An eighth pier was built in 1888 on the property of Bruno Peloquin, and one of the piers built in 1884 was raised 3 feet 4 inches, at a cost of \$947.67. In 1889 another pier was built at the entrance of Chenal du Moine, about  $2\frac{1}{2}$  miles below the village. It was 30 feet long, 24 feet wide and  $21\frac{1}{2}$  feet high and cost \$2,708.28. In 1890, the necessary materials for the construction of another pier, opposite the church, were procured at a cost of \$2,497.11 and in 1891 the structure was carried 5 feet above low water at a cost of \$1,696.25. The pier measures 60 feet by 25 feet at the bottom and 56 by 24 feet on the top. It stands in 7 feet of water and has a height of 12 feet. During the year 1897-98, three new piers were built for the protection of properties which were not guarded by the old ones and one of the latter was strengthened and repaired. The new piers measure 24 feet by 20 feet and are from 12 to 14 feet in height. Their total cost amounted to \$3,514.68.

During 1898-99, three additional ice piers were constructed, one opposite the town of Sorel, one about 1,500 feet above the wharf of Ste. Anne de Sorel, and the third one, about  $1\frac{1}{2}$  miles below the same. These icebreakers were built of the same materials (wood, sound hemlock), and in the same manner and description as those built the preceding year: base 24 feet and 20 feet and of a height varying from 12 to 18 feet, according to the locality and level of the ground. Cost, \$3,594.18.

In the beginning of October, 1898, the construction of a landing pier at Ste. Anne de Sorel was commenced. It consisted of a crib 100 feet long, 18 feet at the base and 14 feet wide of flooring, the height varying from 2 feet to 7 feet, to suit the ground. Ten inch square and round hemlock was used in the construction, also 6-inch sheathing on the breakwaters and 3-inch flooring. The entire crib was filled with stone. At the landing about 5 toises of stone were put in place, to render the access to the wharf easy. These works were completed on November 3, at a total cost of \$1,596.87.

The amount expended during the year was \$5,191.05.

During fiscal year 1899-1900, another pier was constructed at a cost of \$1,009.19. In 1900-01, construction and other repairs cost \$2,028.89.

During the fiscal year 1903-04, the ice pier, opposite Sheppard's mill, was repaired and raised 7 feet at a cost of \$725.

At Ste. Anne de Sorel, a new pier, 20 by 24 feet, 15 feet high, was built on the property of Damase Lavallée; also a new one on Ile du Moine, to replace the old pier which was beyond repair. Another pier in this vicinity was repaired at a total cost of \$3,793.38. On the west side of the Richelieu river, a new pier was built, 20 by 24 feet and 18 feet high, at a cost of \$2,997.92, making a total expenditure, for the fiscal year 1903-04, of \$7,834.13.

During the autumn and winter 1904-05, two piers were erected on Ile du Moine and another at Ste. Anne de Sorel, they being 18 feet by 6 feet at top with one face inclined  $1\frac{1}{2}$  in 1. The latter one was built 18 feet high and the two former ones 12 feet. Expenditure during the fiscal year 1904-05, \$8,881.04.

#### STE. ANNE DU SAGUENAY.

The parish of Ste. Anne du Saguenay is situated on the north shore of the Saguenay river, seventy-two and one half miles above Tadousac, and opposite the town of Chicoutimi. Besides the church and post office, the parish contains several stores, four cheese factories, a lime-kiln, a brick-yard, a potter-yard and saw-mills.

Spring tides rise 17 feet, neaps 9 feet.

There is an hourly ferry to and from Chicoutimi.

Construction.—As early as 1879, the Dominion government was urged to construct a landing pier for the accommodation of the inhabitants of the district. The request was not, however, considered until 1888, when a portion of the timber, for the proposed structure was purchased at a cost of \$2,100.



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In 1889, the pier was commenced from shore outwards, and at the close of the year 1888-89, a portion, 70 feet long and 30 feet wide, on its lower eastern face, had been completed at a cost of \$2,109.69. It was built of close-faced cribwork, filled with stone ballast.

In 1890, this shore block was extended 87 feet on a width of 27 feet, at a cost of \$2,045.50.

In 1891, a further length of 50 feet, of similar cribwork, 27 feet wide, was added at a cost of \$2,498.96.

In 1892, a head block, 30 feet long, 60 feet wide and 20 feet high, was built at a distance of 250 feet from the end of the work, completed the previous year. Expenditure, \$2,262.11.

In 1896, this block was raised  $8\frac{1}{2}$  feet and put on the same level as that of the work built out from shore, viz., 6 feet above ordinary high water spring tide.

With a view of completing the pier to shore, a sum of \$5,575.25 was expended in 1897, for the construction of two cribs, each  $87\frac{1}{2}$  feet long and 25 feet wide placed 25 feet apart and 25 feet from both the head and shore block.

During the year 1898, the three 25-foot openings left in the work were spanned, the flooring was laid and the structure completed to shore, at a cost of \$746.70.

Some boulders were removed in 1894, from the vicinity of the head of the pier, at a cost of \$99.30.

During the year 1899, the planking of that part of the pier constructed in 1888, was renewed over a length of 250 feet, the sides of the crib built in 1897 were sheathed on a length of 200 feet and fenders were placed at the angles.

The work was done by day labour, at a cost of \$1,099.90. During the year of 1900, the outer block, for 110 feet, was sheathed with tamarack, and about 300 feet of the planking was renewed with 3-inch tamarack, at a total cost of \$1,499.99.

During the year of 1901, the sum of \$2,507.36 was expended in renewing the planking of the wharf, over a length of 240 feet and a width of 25 feet. The upper part of the wharf was sheathed, over a length of 110 feet with 6-inch tamarack, and a shed 45 feet by 30 feet was also erected on the wharf.

During the year of 1901-02, a crib 40 feet wide and 27 feet high was constructed at the eastern extremity of the wharf; it is fully sheathed with 5-inch tamarack.

The flooring of the wharf was renewed on a space 200 feet long and 27 feet wide. Expenditure, \$3,103.07.

During the year 1902-03 a movable slip was built, a waiting-room was commenced and the flooring of the wharf was renewed at different places.

Expenditure, \$1,523.30.

The wharf now stands 475 feet in length, 30 feet in width for the first 130 feet from shore, 27 feet for the next 325 feet and 100 feet for the last 30 feet; it stands  $25\frac{1}{2}$  feet high above the bottom of the river, at its outer end, where there is  $7\frac{1}{2}$  feet of water, at low water spring tide.

The wharf has a return, on the western side of the shore, 120 feet in length by 32 feet in width, this return is built from the wharf to the rock.

During the year 1903-04, the shed was covered with sheet iron, the waiting room was completed, a freight shed was built and the flooring was repaired.

Amount expended, \$957.08.

During the fiscal year 1904-05, a new pier, 20 x 20 feet was constructed on the east side of the wharf, at 22 feet from the head block, close to the wharf; the head block is connected with the pier by stringers, supported on corbels, the span and the block are planked over, the pier is sheathed, provided with fenders and fully ballasted with stone.

The pier on the west side of the head block, built in 1901, was repaired and levelled, new stringers were put on and the planking renewed where necessary.

On the west side of the wharf a big boulder was removed by blasting.

Amount expended during the year, \$2,387.87.



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## ST. BLAISE.

St. Blaise is a post village in St. Johns county, on the Richelieu river, on the Grande Ligne branch of the Grand Trunk railway, four miles from St. Johns. It contains two churches, three stores, and telegraph office.

In May, 1905, in order to accommodate the important hay, butter and cheese traffic of the locality, the construction of a wharf was begun. The work consisted in the dredging of a trench some 1,000 feet long, from main channel shoreward, by a width of 50 feet and to a depth of 6 feet below E.L.W.L. Alongside the above and from the shore, a row, 175 feet long, of close piles with a return of 27 feet at outer end, forms the face of the wharf. These piles were cut 5 feet above low water, with cap on top and double fenders in front, and retained every 5 feet by a second series of piles 12½ feet backward, 1½-inch iron anchor bolts 16 feet long securely connecting the two. It is the intention to use the above dredged material as a filling behind the face piles, and form thus a roadway 20 feet wide with a slope of 1 in 1 on the upstream side which will be riprapped.

At the end of June, 1905, all the piles had been driven in and the filling begun. Expenditure, \$2,610.01 exclusive of land for right of way.

## ST. CHARLES BORROMÉE.

St. Charles Borromée is a village situated on the north shore of La Grande Décharge of Lake St. John, in the county of Chicoutimi, at twenty-one miles above Chicoutimi town; it contains one Roman Catholic church, one store, one cheese factory, telegraph and post office. Population about 1,000.

During the fiscal year 1904-05, a certain quantity of timber was bought in view of the construction of two landing piers, for the ferry.

Amount expended, \$996.95.

## STE. EMELIE.

Sainte Emelie is a village in the County of Lotbinière, the post office name is Leclercville. It is situated on the south shore of the St. Lawrence, fifty miles above Quebec. The village is at the mouth of the Grande Rivière du Chêne, the site of an important lumber mill. The nearest railway station is distant six miles.

During the fiscal year 1900-01, the department constructed a wharf at this place. It consists of an isolated block, 53 feet long, 25 feet wide and 19 feet high, connected to the shore by means of a movable trestle approach.

During the last fiscal year, steel plates ¾-inch thick, were put on the western slope of the isolated block, covering 392 superficial feet of sheathing.

In the spring of 1905, the trestle approach was put in place, two new posts were put in, the movable freight shed repaired and a movable waiting room built.

Total expenditure for fiscal year is \$537.09.

## STE. FAMILLE (ILE D'ORLÉANS).

Ste. Famille is situated on the north shore of Ile d'Orleans in the County of Montmorency, about sixteen miles below Quebec.

The extension of the wharf, begun last year, was completed at the end of September, 1904. This extension is 200 feet long by 30 feet wide, and is 21 feet high at the outer end. Part of the flooring of the old wharf was renewed.

The expenditure for the fiscal year 1904-05, amounts to \$15,111.88.

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## STE. FELICIEN.

St. Félicien, a post village in Chicoutimi county, is situated on the Ashuapmou-chouan river, fifteen miles from Roberval, the terminus of the Quebec and Lake St. John railway ; it contains one Roman Catholic church, five stores, two hotels, one saw-mill and several cheese factories. Population about 1,200.

During the year 1895-96, a wharf was built to accommodate the local traffic, this wharf is 70 feet in length, 36 feet in width and 32 feet in height at the outer end, at which vessels drawing 8 feet can lay at low water.

A shed 20 feet square was erected on the wharf, at its outer end.

During the year 1899, an addition, 90 feet long, parallel with the channel, and 40 feet wide, was constructed at a right angle to the wharf, at its outer end.

During the year 1900, 30 feet in length and 10 feet in height was damaged by ice, which damage was repaired at the cost of \$100.

During the year 1903-04, fifteen boulders obstructing the channel were removed. Amount expended \$302.94.

During the year 1903-04, certain repairs were done to the wharf, the sheathing was renewed, the stringers replaced, planking completed and the shed repaired and painted. Amount expended, \$640.49.

During the winter 1904-05, a certain quantity of boulders obstructing the channel were removed at a cost of \$306.57.

## ST. FIDELE.

St. Fidele is situated in the county of Charlevoix, twelve miles below Murray Bay, on the north shore of the St. Lawrence. The population is 1,200.

This place is without railway communication and the trade depends entirely on the navigation. In the village there is one church, six stores and three blacksmith shops.

In order to help the lumber and general trade, a contract was entered into on October 26, 1904, with Messrs. Frs. Tremblay and Ern. Savard, for the construction of a close-face timber cribwork wharf 180 feet by 30 feet for the sum of \$15,266.

At the end of June, 1905, one-third of the work was done, and it is expected to be completed by October 1, 1905.

The expenditure for the fiscal year 1904-05 amounts to \$3,162.03.

## ST. FRANÇOIS (ILE D'ORLÉANS).

St. François, is situated at the lower end of Ile d'Orleans, in the county of Montmorency.

During the last fiscal year a small scow was constructed to communicate from the shore to the isolated pier; a fence was also built around the government property.

The expenditure for the fiscal year 1904-05 amounts to \$184.21.

## ST. FRANÇOIS DE SALES.

St. François de Sales is a post village in Laval county, on Isle Jesus, half mile from Terrebonne on the other side of River Jesus. Population, 850.

During spring, 1905, materials were bought for the construction of a high and low level wharf at this place, at a cost of \$6,947.90.

This wharf will stand downstream and alongside the old Masson pile bridge, between St. François and Terrebonne. It will be 238 feet long, measured from the public road.

1. The high level portion will be formed : (a) Of three concrete piers distanced 40 feet at top and measuring 40 feet 9 inches by 9 feet 8 inches at bottom, 21 by 6 feet

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at top (the upstream face used as icebreaker being inclined  $1\frac{1}{2}$  in 1 and nosed 90 degrees), 23 feet high from low water and resting on close-faced stone filled cribs, 44 feet by 13 feet, standing in an average of 3 feet of water; (b) Of a stone and earth approach 100 feet long, inclusive of concrete abutment, inclined in front 1 in 12, also 23 feet high, 3 feet deep at top with 2 one-foot retreats at back augmenting depth to 5 feet at bottom, and 45 degree return wings. All the concrete shall be re-enforced with  $1\frac{1}{2}$ -inch iron bars and plates, washers and nuts.

2°. The low level portion shall be of the same length and built alongside and down stream of the high level one. It shall be composed of a crib close-faced on down stream side, 10 feet deep and properly filled with stone so as to form a width of 18 feet at top, the upstream side between the concrete piers being riprapped 1 in 1, and standing 6 feet above low level in an average of 3 feet of water.

## ST. FULGENCE.

St. Fulgence (otherwise called L'Anse aux Foins) is a small village in Chicoutimi county, on the north shore of the Saguenay river, ten miles below Chicoutimi.

It contains one Roman Catholic church, four stores and two saw-mills.

During the year 1903-04, the construction of a wharf was commenced, it consists of a shore approach, 75 feet in length, 22 feet in width and 10 feet in height, and of a block of cribwork 25 x 22 feet, 14 feet high, placed at a distance of 25 feet from the outer end of the approach.

This work is built of round logs open-faced, and intended to be sheathed; the whole is fully ballasted.

Expenditure, \$998.37.

During the fiscal year 1904-05, the approach, the first pier and other piers of 25 by 22 feet placed at 25 feet apart, were completed. Fenders of 8 by 10 inches put on; the stringers and the corbels are of 12 x 12-inch timber, the planking is of 3-inch spruce. At the end of the year, 275 feet of the wharf was completed, except the sheathing.

Another pier was commenced and built 14 feet in height.

Spring tides rise 17 feet; neaps, 9 feet.

Expenditure during 1904-05, \$4,993.37.

## ST. GEDEON ISLANDS.

St. Gédéon Islands, in the parish of St. Gédéon, are situated on the south-east shore of Lake St. John, thirty-nine miles west of Roberval.

The parish contains one Roman Catholic church, several stores, post office, two cheese factories, two saw-mills, telegraph and railway stations. Population about 1,200.

During the year 1903-04, a certain quantity of timber was purchased in view of the construction of a wharf at that place. Amount expended, \$1,982.19.

On July 13, 1904, a contract was entered into for the sum of \$8,990, for the construction of a wharf in the Bay of St. Gédéon's islands.

The work done consisted in the construction of an abutment 20 feet long; of seven piers 20 by 20 feet built 25 feet apart; of a head block 40 by 30 feet and 26 feet in height at outer end, where two slips have been constructed; the whole work is completed.

Amount expended, \$7,525.62.

The depth of water at outer end is 7 feet.

In spring, water rises 14 feet.

## STE. GENEVIEVE.

Ste. Genevieve, is a post village in Jacques Cartier county, on River des Prairies, on the Grand Trunk railway and Canadian Pacific railway, three miles

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from Beaconsfield and five miles from Pointe Claire. It contains one church, one convent, two hotels, butter and cheese factories, telegraph office and fifteen stores. There are excellent mineral springs in the vicinity.

In 1890-91, a pier was constructed consisting of four cribs with ice-breakers, 20 feet by 30 feet at low water line and 20 feet square on top, placed 20 feet apart and the roadway covered with 3-inch planks. The approach was 76 feet in length, making the total length of wharf 239 feet. Cost, \$9,433.58.

During 1898-99, the sheathing was renewed a total length of 120 feet and 16 feet high with 8-inch tamarack; the four piers were raised for 1 to 3 feet and stringers partly renewed. Cost, \$1,036.16, not quite finished.

In July, 1899, the above repairs were completed at a cost of \$208.96.

During fiscal year 1901-02, more extensive repairs were made; a number of stringers between cribs and part of the flooring were renewed and the guard railing repaired. Cost \$1,106.52.

In March, 1903, the sum of \$135.45 was expended in repairs to stringers and flooring.

In 1903-04, the two top tiers of the cribs and abutment were renewed; a 12 x 12-inch post was placed inside the downstream corner of each crib and secured to the face-timber with 1-inch screw bolts and 3-inch washers; the wooden stringers were replaced by three 18-inch I-steel beams with 8-inch channel connections and 6-inch I-steel beams laid across every 3 feet and properly secured to the main beams; a new flooring of 3-inch pine deals was laid diagonally and secured to the 6-inch I-beams; an iron guard-railing was adjusted on both sides. The whole by day labour at a cost of \$2,596.71, inclusive of \$1,278 for the steel materials furnished and erected by the Phoenix Bridge and Iron Works Company.

During the spring of 1905, the sheathing of slanting-face of each pier was renewed and covered with  $\frac{1}{2}$ -inch steel plates, at a cost of \$2,227.93.

## ST. GODEFROY DE NOUVELLE.

St. Godefroy de Nouvelle, in the County of Bonaventure, is a parish situated at the foot of the Baie des Chaleurs, having a population of about 2,500 inhabitants, partly engaged in the fishing industry. There is also a considerable lumber trade done at this place. The railway station on the Atlantic and Lake Superior railway, is known under the name of 'La Nouvelle.'

On May 31, 1904, a contract was entered into for the construction of a breakwater, in the sum of \$19,300.

The works under contract consisted of six contiguous cribs commencing at the shore; the shore end crib to be 150 feet long and the five others 100 feet each, giving a total length on top of 650 feet of continuous cribwork superstructure, with an average width of 20 feet. The depth of water at the outer end is 14 feet 3 inches at high water spring tides.

Spring tides rise 7 feet.

This work was built and completed during the last fiscal year, and the approach to the breakwater was also constructed.

The expenditure during 1904-05 amounted to \$18,508.46.

## ST. IGNACE DE LOYOLA.

St. Ignace de Loyola, in Berthier county, is a small settlement on an island of the same name, in the River St. Lawrence, between Berthier and Sorel, at the entrance of Lake St. Peter. Population on island, 935.

During the spring of 1905, materials consisting of timber and bolts for a wharf at St. Ignace, and stone and cement for two icebreakers on Isle du Pads opposite, were bought at a cost of \$1,797.39.

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It is the intention to build : 1. Opposite the church and on property given to the Crown by the church wardens, a pile structure 49 feet long, 33 feet wide and standing 16 feet high in 8 feet of water at low level. 2. Two icebreakers at the upper end of Isle du Pads. These will be of stone covered with a coat 1 foot thick of concrete mixed 1, 3, 5 and with  $1\frac{1}{2}$ -inch iron bars connecting two opposite faces. They will be 12 feet high and measure 6 feet square at top, with two faces inclined  $1\frac{1}{2}$ -inch in one and the other two 1 in 12, making the ground dimensions 18 feet 10 inches square.

## STE. IRENÉE.

This village is situated in the County of Charlevoix, on the north shore of the St. Lawrence, seventy-eight miles below Quebec and some six miles west of Murray Bay.

During the present year a movable slip was constructed. The wharf was also levelled and a few piles were placed at the end to prevent it from sinking. The expenditure for the fiscal year 1904-05, amounts to \$907.97.

## ST. JEAN (ILE D'ORLÉANS).

St. Jean, in the County of Montmorency, is situated on the south shore of Ile d'Orleans, sixteen miles below Quebec.

During the year 1904-05, the flooring of the wharf was renewed, and about one-third of the wharf was sheathed with hardwood; six mooring posts were put in and the buildings repaired.

The expenditure for the fiscal year 1904-05, amounts to \$956.79.

## ST. JEAN DES CHAILLONS.

St. Jean des Chaillons, a post village and parish in Lotbinière county, is situated on the River St. Lawrence, fifty-seven miles above Quebec.

Population of village, 1,000.

In September, 1904, a contract was entered into with Mr. Chs. Pagé, for the construction of a landing pier at this place. Contract price, \$33,233.75.

Owing to delays experienced in securing deeds of land required, work had not yet been commenced on June 30, 1905.

Expenditure during fiscal year 1904-05, for plans, advertisement for tenders, &c., amounted to \$893.20.

## ST. JEAN PORT JOLI.

The village of St. Jean Port Poli, in the County of L'Islet, is situated on the south shore of the St. Lawrence, 60 miles below Quebec.

Spring tides rise 21 feet; neaps, 13 feet.

An addition to the wharf, 50 feet long, 38 feet wide and 30 feet high, was built during the fiscal year ended June 30, 1905; the block is of close-faced cribwork very strongly constructed and thoroughly filled with stone.

The wharf has now a total length of 504 feet, a depth of water of  $6\frac{1}{2}$  feet is found at the outer end, at low water spring tides. It consists of a shore part, composed of piers connected by spans, 180 feet long and 18 feet wide; a middle section, 174 feet in length, open cribwork, and a head block of 150 feet long, 38 feet wide and 30 feet high at the outer end.

The amount expended during the last fiscal year, was \$5,999.59.

The work was done by day labour, during months of October, May and June.

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## ST. JEROME.

St. Jérôme is a village situated on the south-east shore of Lake St. John, 24 miles east of Roberval ; besides the church, post office, telegraph and railway station, the parish contains several stores, three cheese factories, and two saw-mills.

The wharf built in the year 1899-1900, consists of an approach, 75 feet in length, 25 feet in width and 15 feet in height, filled with ballast, sand, &c., two blocks, 75 feet in length by 25 in width, placed 25 feet apart and connected by stringers. The whole top of the wharf, 275 feet in length, was covered. Amount expended, \$4,999.28.

During the year 1900-01, an addition, 400 feet long, 25 feet wide and 24 feet high was built at a cost of \$6,933.90.

In 1901-02, the addition was completed at a cost of \$1,999.97.

During the year 1902-03, a block 60 feet long, 25 feet wide and 27 feet high, was sunk in 7 feet of water at low water, 110 feet from the present wharf, to which it is intended to connect it by the construction of two piers and spans. The head block is built with a slip sheathed with 8-inch hardwood, and filled with stone.

Amount expended, \$2,595.20.

During the year 1903-04, two piers were built in the space between the outer block and the wharf, the corbels and stringers 10 by 12 feet for the two spans were laid and covered with 3-inch deals.

Amount expended, \$2,146.64.

During the year 1904-05, the stringers were laid, the planking completed and the sheathing commenced.

The amount expended, was \$727.73.

## ST. JOHNS.

St. Johns, the chef lieu of the united counties of St. Johns and Iberville, is situated on the Richelieu river, 27 miles south-east of Montreal. It contains district and county buildings, churches, banks, military school and barracks, 12 hotels and about 100 stores, important manufactures of silks, potteries, &c. The town is lighted by electricity and has a good system of waterworks. The C.P.R., G.T.R., Central Vermont and Delaware and Hudson enter the city which has a large trade in lumber, grain and country produce. Population, 4,030.

In order to give valuable assistance to boats passing through the swing span of the Vermont Central Railway bridge, at St. Johns, a boom was constructed. It has a length of 350 feet by a width of 4 feet, and is moored to clusters of 5 piles each, driven 15 feet into the ground every 50 feet, except the upstream cluster which has ten piles and is protected against the ice by a steel plate, 6 by 6 feet, and  $\frac{1}{2}$ -inch thick. The piles of each cluster are well secured together by screw bolts.

The boom stands in 9 feet of water at extreme low water level, and in 14 feet at extreme high water level. The timber used is 12 by 12-inch hemlock for the booms, and round pine and oak 14 inches at butt end for piles. The work was commenced in November, 1900, and completed in April, 1901, at a cost of \$1,504.45.

During the spring, 1904, the head and two intermediate clusters of piles were broken by the ice, and the boom was also much damaged. A close cribwork ice-breaker 20 by 12 feet and 18 feet high was built, in place of the head cluster of piles, to moor the boom ; the two broken clusters of piles were renewed, the boom was repaired and sheathed diagonally with 3-inch pine deals. The work was carried out by day labour at a cost of \$1,259.88.

In 1904-05, minor repairs to piles and boom cost \$206.64.

## ST. LAURENT (ILE D'ORLÉANS).

St. Laurent, in the County of Montmorency, is situated on the south side of Ile d'Orléans 10 miles below Quebec. This place is frequented as a summer resort.

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During the year 1904-05, one third of the flooring of the wharf was replaced and three new fenders were put in.

The expenditure for the fiscal year amounts to \$891.92.

## ST. MICHEL.

St. Michel, in the County of Bellechasse, lies on the south shore of the St. Lawrence, fifteen miles below Quebec.

The site of the village is picturesque and the place is frequented as a summer resort. The coasting steamer 'Champion' calls there twice a day, giving good facilities for traffic in farm produce.

Spring tides rise 21 feet; neaps, 13 feet.

In the course of the fiscal year 1904-05, the outer block of the wharf, which had settled  $2\frac{1}{2}$  feet on account of the scouring and washing away by the current and the waves, of the ground around and under the block, was thoroughly repaired and levelled. By means of a pile driver, sheet piles of pitch pine, 10 by 10 inches, varying in lengths from 30 to 38 feet were driven along the west, north and east faces, a mean depth of 8 feet through the bottom and secured to the face timbers with iron screw bolts, one inch in diameter.

Previously to the driving of the piles, the ballast was taken out and before replacing it, the ballast floor was pulled out, allowing the stones, when put in again, to rest upon the bottom. The superstructure was then raised level with the top of the wharf and the whole neatly finished.

The shed standing over the block, which had to be moved along, to provide room for the pile driver, was replaced and painted.

The pitch pine piles were bought and paid for out of the last year appropriation, and the amount expended to perform the work during the fiscal year ended June 30, 1905, was \$1,548.66 exclusive of dredging.

This wharf is now in first class order.

## ST. ROCH DES AULNAIS.

The village of St. Roch des Aulnais, in the County of L'Islet, is on the south shore of the River St. Lawrence, 66 miles below Quebec.

Spring tides rise 21 feet; neaps, 13 feet.

During the year 1904-05, to widen the head of the wharf, which was only 20 feet wide, an addition, 50 by 20 feet was built on the north side of the wharf, at the outer end; the crib is close faced, filled with stone.

A portion of the approach which was submerged at almost every high tide, has been raised  $2\frac{1}{2}$  feet on a length of 300 feet. The materials used were stone and gravel.

The expenditure during 1904-05 amounted to \$2,499.99.

## ST. SIMÉON.

St. Siméon is situated on the north shore of the St. Lawrence in the County of Charlevoix, 107 miles from Quebec. It contains two churches, five stores, two blacksmith shops and a large saw mill. The trade of this place is quite flourishing.

On October 28, 1904, a contract was entered into with Mr. Napoléon Trudel, for the construction of an approach to the isolated pier, built some ten years ago. This approach consists of a close face timber crib 425 feet by 30 feet filled with stone ballast. The contract price is \$19,062.67.

This construction will prove a great amelioration to the village of St. Siméon and the surrounding district; and if the steamers of the Richelieu and Ontario Co. call at that wharf, the place is bound to become one of the most frequented summer resorts of the lower St. Lawrence.



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At the end of June, 1905, the work was nearly half completed, and it is expected to be completed on the 1st September, 1905. The expenditure for the fiscal year 1904-05 amounts to \$3,088.59.

## TERREBONNE.

Terrebonne is an incorporated town in Terrebonne county, situated on River Jesus, a branch of the Ottawa, and on the Canadian Pacific railway, sixteen miles north of Montreal. It contains two churches, two telegraph agencies, express office, three hotels, fifteen stores, carding, shingle, fulling, saw and grist mills and manufacturing of iron castings and agricultural implements. It possesses important water-power, partly used to light the streets and some private residences. There are extensive limestone quarries in the vicinity. Population 1,822.

As at St. François de Sales, on the opposite shore of River Jesus, it was decided to build a high and low level wharf at this place, and in June, 1905, materials costing \$6,946.44 were bought to this effect.

The wharf will be commenced next year. It will stand downstream and alongside the old Masson bridge, the right of way being given to the Crown by the municipality. It will be 229 feet long, measured from the public road.

1. The high level portion will be formed: (a) Of three concrete piers distanced 40 feet at top and measuring 40 feet 9 inches by 9 feet 8 inches at bottom, 21 x 6 feet at top (the upstream face used as ice-breaker being inclined  $1\frac{1}{2}$  in 1, and nosed 90 degrees), 23 feet high from low water and resting on close-faced stone filled cribs, 44 feet by 13 feet, standing in an average of 3 feet of water. (b) A stone and earth approach 91 feet long, inclusive of concrete abutment, inclined in front 1 in 12, also 23 feet high, 3 feet deep at top with two 1-foot retreats at back augmenting depth to 5 feet at bottom, and 45 degree return wing. All the concrete shall be reinforced with  $1\frac{1}{2}$ -inch iron bars and plates, washers and nuts.

2. The low level portion will be of the same length and built alongside and downstream of the high level one. It will be composed of a crib close-faced on downstream side, 10 feet deep and properly filled with stone so as to form a width of 18 feet at top, the upstream side between the concrete piers being riprapped 1 in 1 and standing 6 feet above low level, in an average of 3 feet of water.

## THREE RIVERS.

The City of Three Rivers is situated on the northern bank of the River St. Lawrence at the mouth of the River St. Maurice, seventy-four miles below Montreal and sixty-eight miles above Quebec. Population, 10,000.

In June, 1902, a contract was entered into with Mr. Randolph MacDonald for the construction of a deep water wharf with a mooring face of 1,968 feet on the river side, with a return of 24 feet to connect the lower end of Dean's wharf. The contract includes the construction of an icebreaker, 50 x 100 feet and 53 feet high or 23 feet above low water.

Contract price, \$280,500.

In 1902-03, the expenditure amounted to \$49,914.21; in 1903-04, to \$49,179.03.

During the fiscal year 1904-05, anchor piles, for a length of 1,392 feet of wharfage were driven, consisting of eighty-six groups, of which only fifteen were bunched. Round piles, 45 feet long, for a length of 900 feet were driven; squared piles, at 8-foot spaces, for a length of 618 feet, and sheet piles, for a length of 438 feet were placed; 30 anchor rods were put in place and 3,327 cubic yards of stone and 13,495 cubic yards of earth were deposited in the work.

Expenditure for the fiscal year was \$39,201.35.

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## TOULADIE RIVER.

The Touladie river is one of the finest tributaries of Lake Temiscouata; is much frequented by American sportsmen for fishing and moose hunting.

Every year, an immense quantity of logs is driven down this river, from the upper lakes to Lake Temiscouata.

With a view to diminish the incline of rapids and allow the towing of boats by horse power, from Lake Témiscouata to Lake Touladie, an agreement was made with Messrs. Donald Fraser & Sons, of Cabano, to build a dam across the Touladie river, at about half a mile below Lake Touladie.

The dam has a total length of 365 feet, a width of 26 feet at the base, by a height of 14 feet, there are four sluice gates 12 feet wide, and a waste weir 3 feet high and 100 feet long, to provide for the overflow of water during freshets.

The work was completed in the month of October, 1904, and the amount paid to Messrs. Fraser was \$2,500.

Total expenditure during last fiscal year, \$2,500.

## TROIS PISTOLES.

Trois Pistoles, in the County of Témiscouata, is a village on the Intercolonial Railway, twenty-five miles below Rivière du Loup; it is a flourishing centre to which converges an extensive traffic.

At about two and a half miles from the village, is the River Trois Pistoles, where Messrs. Tobin & Company own large saw-mills; the same company operates, about six miles up the river, a pulp mill where products are delivered to the Intercolonial, at McKenzie siding, by a railway branch.

With a view to protect the harbour from north-east winds, a breakwater was built across the cove, its length being 350 feet by a width of 20 feet on a mean height of 15 feet.

The work was commenced in May, 1904, and was nearly completed during the past fiscal year.

Spring tides rise 18 feet; neap tides, 10 feet.

The total expenditure during the past fiscal year amounted to \$3,742.32.

## VERCHÈRES.

Vercheres is a post village and parish in Vercheres county, on the south shore of River St. Lawrence, and a station on the South Shore railroad, twenty-one miles north-east of Montreal. It contains a Roman Catholic church, four stores, one hotel, two saw-mills and a butter factory. Population, 1,689.

The Richelieu and Ontario Navigation Company has a small wharf at Vercheres, but it being private property and totally inadequate to the requirements of traffic, it was decided to build a public wharf. To this effect, materials were purchased in October and construction, by day labour, started in November, 1903, suspended during the winter and resumed in May, 1904. At the end of June of the same year, work was well under way. Expenditure, 1903-04, \$5,228.

The wharf consists of : a pile-head block, 96 feet 6 inches at top with icebreaker inclined  $1\frac{1}{2}$  in 1 at upstream end, with a width of 40 feet 4 inches, standing 13 feet high above low water; a pile approach, 224 feet long by a width of 20 feet; and a stone embankment, 300 feet long by a width of 20 feet at top, with sides sloped 1 in 1.

Work was continued during last fiscal year and the wharf completed at the end of June. Expenditure, 1904-05, \$3,010.69.

It was transferred to the control of the Department of Marine and Fisheries during the year.

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## VILLE MARIE (BAIE DES PÈRES).

Ville Marie, Pontiac county, is an important agricultural centre situated on Baie des Pères. It is a point of call for passenger and freight boats plying on Lake Temiskaming. There being no railroad connections, landing facilities are indispensable.

In 1887, the Dominion government purchased from the Lake Temiskaming Colonization Railway Company their wharf for the sum of \$3,000 (See O.C. 83,568 ; 20-12-87). The wharf consists of an approach some 400 feet in length, 16 feet wide, leading to a landing head 26 by 43 feet in surface dimensions, the frontage of which is 26 feet. The whole structure is built of small open faced cribwork piers supporting the floor system, 15 feet above low water level.

In 1892, \$68.12 was spent on repairs; the work was thoroughly repaired in 1895, at a cost of \$945.63; and in 1896, \$25.65 was expended on the wharf. The head of the wharf has been added to materially by the navigation interests.

At its session of 1903, parliament appropriated \$2,500 towards required repairs to the upper structure of the government part of the wharf, but no repairs were made that year, because local interests demanded that the amount available be applied towards the construction of a wharf, on a different site, which, upon examination, proved not to be practicable.

The sum of \$2,500 was revoked in 1904. During the fiscal year 1904-05, some urgent repairs were made at a cost of \$356.23, but on account of interference with the heavy traffic the work was only of a temporary nature. The sum of \$160.43 was paid to the Lumsden Line Steamers for repairs between 1896 and 1904. Orders were placed for 75 per cent of the materials required for the reconstruction.

Expenditure during the fiscal year 1904-05, \$516.66.

Total expenditure to date, \$4,556.06.

## PROVINCE OF ONTARIO.

## ALLENDALE OR BARRIE.

Allandale, a ward of the town of Barrie, is situated on Kempenfeldt bay, an arm of Lake Simcoe, and is distant 66 miles north-west from Toronto.

At the last session of parliament, the sum of \$2,500 was appropriated for a wharf and dredging at Allandale ward, town of Barrie, and authority was given on July 22, to expend the amount.

The work consisted in the building of a wharf composed of stone approach, 270 feet in length, and cribwork with concrete superstructure at outer end, 100 feet in length. Work commenced on October 13 and closed down for the winter on November 26. Work was resumed on March 20 and was continued to June 30.

Total expenditure for fiscal year, 1904-05 :—

Labour and superintendence. . . . .	\$1,443 00
Materials. . . . .	1,157 00
	<hr/>
	\$2,600 00

## AMHERSTBURG.

Amherstburg, County of Essex, township of Malden, is situated on the east bank of the Detroit river, about 5 miles from Lake Erie and 18 miles south of Windsor, to which place it is connected by electric car service.

The Michigan Central railway also runs into Amherstburg. Population about 2,500. It is one of the oldest settlements in Ontario.

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During the last session of parliament the sum of \$2,000 was appropriated for the removal, by day labour, of large boulders in the vicinity of the south end of the town, to facilitate the approach from the main channel to the docks, on water front; those boulders are to be utilized for the protection of the river bank against scouring, along the Malden front. Work commenced on September 20, 1904, and continued until November 19, 1904.

The total expenditure during the fiscal year 1904-05, was \$4,271.22.

## BARRY'S BAY.

Barry's Bay, in the County of South Renfrew, on the Ottawa division of the G.T.R., is at the head of a thirty-mile stretch of the Madawaska river, accessible to boats of shallow draught. On account of rich corundum deposits, a heavy traffic has developed.

At its session of 1904, parliament appropriated the sum of \$4,500 towards the construction of a wharf at this place. A supplementary amount of \$256 was granted during the session of 1905.

The work was awarded by contract in August, 1904, for the sum of \$4,433. Construction commenced in September, 1904, and was completed in November of the same year. The structure consists of a close-face cribwork landing block, measuring 25 feet in width by 100 feet on the front where there is a depth of 3½ feet at lowest water. The flooring stands 6 feet above L.W.L. There are suitable wagon and railway approaches formed of stone riprap and earth filling. The former, 107 feet long has a minimum width of 16 feet at the top, and the latter, 300 feet in length and 12 feet in top width, is built on a curve of 12° with the face of cribwork as tangent.

Extras paid to the contractor amounted to \$115.64: for adding a slip; building a temporary landing, and extending the flooring. The cost of inspection was \$257.

In the spring of 1905, the wagon approach and adjacent roadway, having suffered from freshets, were repaired at a cost of \$51.75.

Expenditure during fiscal year 1904-05, was \$4,770.74.

## BAYFIELD.

Bayfield, a village in the County of Huron, situated on the eastern shore of Lake Huron, at the mouth of Bayfield river, 12 miles south of the town of Goderich. There is one grist and saw-mill at this place, but the principal industry is fishing.

At the last session of parliament the sum of \$3,200 was appropriated for repairs to the north pier and approach, and on August 8, 1904, orders were issued to proceed with repairs by day labour. Arrangements were also made with the Marlton Dredging Company, of Goderich, to do the required dredging.

The Marlton Company's plant worked 330 hours between the 15th August and 4th October, 1904, removing 20,400 cubic yards of hard clay, gravel and sand.

The work done on repairs to piers consisted in the renewal, from low water level, of about 200 feet of the superstructure of the north pier, the renewal of a portion of the rear wall and the placing of stone filling in south pier.

Some dredging was done at the entrance to the harbour and between piers.

Total expenditure during fiscal year 1904-05:

Labour and superintendence. . . . .	\$ 108 58
Materials, timber, iron, stone, &c. . . . .	213 67
Dredging, including inspector's wages. . . . .	2,828 88
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	\$3,151 13

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## BAYSVILLE.

Baysville is a small village of 200 inhabitants, situated on the south branch of the Muskoka river, in the Muskoka district, and distant 16 miles east of Bracebridge, the nearest railway point.

At the last session of parliament, the sum of \$1,200 was appropriated for the construction of a pile wharf on the Muskoka river, at this place, and on the 10th September, authority was given to expend the appropriation.

On the 26th September, orders were issued to divide the appropriation, so as to build a wharf on the west side of the river to cost \$900.00, and a smaller one, on the east side, to cost \$300.00. Work on the west side, commenced on the 6th October, and closed down for the winter on the 8th December, 1904.

The work consists in the construction of a pile wharf, 75 feet long and 25 feet wide, on the west side, and a wharf, 20 feet by 30 feet on the east side of the river.

Total expenditure for fiscal year 1904-05, \$1,219.33.

## BEAVERTON.

Beaverton is a thriving village also a summer resort, situated on the easterly shore of Lake Simcoe, seventy-two miles north of Toronto and in the County of Ontario. Population about 1,000. It is on the line of the Midland branch of the Grand Trunk railway, and also on a branch line of the James Bay railway.

During last session of parliament \$11,000 was appropriated for dredging, construction of pile protection work and sheet-piling for landing places in the harbour.

Work was commenced on October 9, 1904, and on June 30, 1905 the following work had been done:—

Two hundred and fifty-one feet of pile protection work was completed at outer end of breakwater on northerly side of harbour.

Anchor piles for 160 feet of sheet-piling for landing places, on each side of the river were driven.

Stone filling was placed in openings in the existing wharf, on the southerly side of the entrance to the river.

Owing to the hardness of material met with in the bottom, it was found necessary to defer the driving of the sheet-piling, until after the dredging is done at this place.

Total expenditure for the fiscal year 1904-05, \$2,975.46.

## BELLE RIVER.

Belle River is situated on the south shore of Lake St. Clair, on the London and Windsor division of the Grand Trunk railway, ninety-three miles from London and seventeen miles from Windsor. It is a French settlement with about 1,000 inhabitants. Farming is the principal industry in the neighbourhood.

At the last session of parliament the sum of \$7,900 was appropriated for repairs and construction of close-piling and dredging of entrance channel to river, &c.

On July 22, 1904, authority was given for the renewal of sheet-pile protection work, on the westerly side of the entrance to the river, which work was completed on November 17, 1904. On February 4, 1905, further authority was given for the expenditure of \$1,200 for the construction of sheet-pile protection work, on easterly side of the entrance to the river, for the protection of the bank and highway at this point. This work was commenced on February 11 and completed on May 17, 1905.

The total work done consisted in the construction of 266 feet of 7-inch close-piling 16 feet long, on the westerly side of entrance to the river, and 145 feet of similar piling on the easterly side of the river.

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The total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$ 653 52
Materials, timber, iron, &c. . . . .	1,759 76
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	\$2,413 28

#### BLANCHE RIVER.

The Blanche empties into Lake Temiskaming just west of the Quebec boundary. It is navigable to Tomstown, twenty-six miles from the mouth. On an average the width is 150 feet and the depth 10 feet. The river runs through a clayey formation interspersed with thin sand strata dipping towards the stream. The landslides which are of common occurrence have so obstructed the bed by the accumulation of sediment on account of the residual snags, that extensive works are necessary to restore to the settlers their only highway. Traffic is heavy, considering that one to two steamboats make the round trip of ninety miles from New Liskeard daily.

At its session of 1904, parliament appropriated \$7,000 to begin operations. During the navigation season of 1904, the waters of Lake Temiskaming remained comparatively high, delaying the commencement of operations.

On June 30, 1905, the sum of \$181.30 had been spent in preliminary work of building a snagboat.

Expenditure during fiscal year 1904-05, \$181.30.

#### BLIND RIVER.

Blind River is a village situated on the north channel of Lake Huron, in the district of Algoma, it is a station on the Canadian Pacific railway. Extensive lumbering operations are carried on at this place.

At the last session of parliament, the sum of \$7,000 was voted to complete the wharf at this place; for dredging a channel to the wharf, and \$1,600 for a warehouse, 40 feet by 75 feet. Authority was given on June 23 and September 10, to expend these amounts.

Warehouse.—Work was commenced on the warehouse on July 6, and the building was finished on September 30. In building same, the following quantities of materials were used: 32,632 f.b.m. pine, 34,000 shingles, 1,576 pounds iron and 350 brick.

Dredging.—Dredging of the channel was commenced June 29, and finished November 5, 1904. The dredge worked 1,164 hours removing 39,269 cubic yards of material at a cost of \$9,212.

Total expenditure for fiscal year, 1904-05, \$11,203.71.

#### BOWMANVILLE.

Bowmanville, or Port Darlington, is situated on the north shore of Lake Ontario, County of Durham, forty-three miles from Toronto, by rail, on the Grand Trunk division of the main line between Toronto and Montreal. Population, 3,500.

At the last session of parliament, the sum of \$2,600 was appropriated for repairs to breakwater at this place, and authority was given on July 22, to expend the amount by day labour. Work was commenced on September 13, and closed down on September 21, on account of continued rough weather, and was recommenced May 8, and completed June 30.

Total expenditure for fiscal year, 1904-05:—

Labour and superintendence. . . . .	\$ 511 75
Materials. . . . .	2,088 25
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	\$2,600 00

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## BRACEBRIDGE.

Bracebridge is a town situated on the north branch of the Muskoka river, district of Muskoka, 125 miles by rail, north of Toronto.

At the last session of parliament, the sum of \$5,800 was appropriated for the construction of a wharf at this place, and authority was given on October 20, to expend this amount.

A contract was let on October 31, to John Baker, of Bracebridge, for the sum of \$8,200 to construct a crib wharf, 150 feet long by 20 feet wide, with a backing of stone 150 feet long, to fill in completely from the rear of the crib structure to the shore.

Work was commenced on October 28, and was completed June 24, 1905.

Total expenditure for fiscal year, 1904-05, \$6,960.91.

## BRONTE.

Bronte is a village in the County of Halton, on the north shore of Lake Ontario, twenty-seven miles south-west of Toronto.

At the last session of parliament, the sum of \$3,000 was appropriated to complete repairs to piers at this place, and authority was given on September 10, 1904, to expend \$2,000 and on October 19 to expend \$1,000. Work commenced on September 22, and continued until November 29, when work closed down for the winter. Work was resumed on April 8 and was finished June 30.

The following work was completed :—

Two cribs, 50 feet long, 24 feet wide and 16 feet deep were sunk in extension of east pier; one crib 40 feet long, 16 feet wide and 10 feet deep was sunk in extension of west pier; 114 feet of superstructure of the eastern pier, at inside end of harbour, 2 feet in depth was renewed.

Total expenditure for fiscal year 1904-05, \$3,532.81.

## BURKE'S FALLS.

Burk's Falls is a village of 650 inhabitants situated in the Township of Armour, in the district of Muskoka, on the Grand Trunk railway, 56 miles south of North Bay.

Authority was given on May 15, 1905, to expend the sum of \$35 in painting the government storehouse at this place, and a contract was let to Adrian Bailled to do the work for the above price.

Work was completed on June 27, and final estimate given.

Total expenditure for fiscal year 1904-05, \$287.

## BURLEIGH FALLS.

Burleigh Falls is a summer resort at the head waters of Stoney lake, Peterboro county.

At the last session of parliament, the sum of \$1,200 was appropriated for the construction of a wharf at this place, and on September 10, authority was given to expend this amount. \$200 extra was granted on May 1, 1905.

The work consists in the construction of a crib and space wharf 130 feet in length. Work commenced on September 28 and continued until January 7, when it ceased for the winter. Operations were resumed on May 1, and work was completed on May 8.

Total expenditure for fiscal year 1904-05 :—

Labour and superintendence. . . . .	\$ 656 76
Materials. . . . .	788 65

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\$1,445 41



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## BURLINGTON CHANNEL.

Burlington Channel, in the County of Wentworth, is simply a cut through a piece of low land which partly separates Lake Ontario from a large sheet of water called Burlington bay, enabling vessels to reach the wharfs at the city of Hamilton.

At the last session of parliament, the sum of \$23,000 was appropriated to complete renewals and repairs to the structures at this place.

On October 19th, 1901, a contract was let to Mr. James Clark, of Goderich, for \$96,700 to reconstruct the superstructure of the west end of the south pier, and to protect the channel sides of both piers with sheet piling. The work was completed on December 1st, 1904.

The swing bridge staff was employed from July 1st to December 20th, when the lights were put out and navigation closed for the season; commencing again April 1st and continuing for the season.

Authority was given on September 14, 1904, to expend \$650 in repairs, and was again given on October 19, to expend \$2,700 in extra repairs to lake end of south pier, also on September 13, authority was given to expend \$400 in building crib for ferry slip, and on September 19, authority was given to purchase 4,000 cubic yards of stone.

The following repairs were made: building crib in old ferry slip; filling in stone between sheet piling and old pier, and repairing east end of south pier.

Total expenditure for fiscal year 1904-05, \$31,005.28.

## CAPE CROKER.

Cape Croker is an Indian settlement and reservation on the west shore of Georgian bay, fifteen miles north-east of Wiarton.

At the last session of parliament, the sum of \$2,400 was appropriated for the construction of a wharf 247 feet in length, and authority was given on February 3rd to expend this amount. Work was commenced on March 28, and completed on July 6th.

Total expenditure for fiscal year 1904-05, \$2,340.70.

## COBourg.

Cobourg is a large town situated on the north shore of Lake Ontario, in the County of Northumberland, on the main line of the Grand Trunk railway, 66 miles east of Toronto.

At the last session of parliament, the sum of \$3,000 was appropriated for repairs to wharf at this place, and authority was given on June 15th to expend this amount. Work commenced on June 17th, 1905, and was completed on 30th of the same month.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence. . . . .	\$ 131 50
Materials. . . . .	2,868 50
	<hr/>
	\$3,000 00

## COLCHESTER.

Colchester is a village situated on the north shore of Lake Erie, in the Township of Colchester, in the County of Essex, about four miles south of Harrow, the nearest point on the line of the Père Marquette railway. Population about 200.

It is the centre of a very progressive farming district, and more particularly in the raising of tobacco, corn and hogs.

During the last session of parliament, the sum of \$1,200 was voted for the construction of a landing wharf, the inner approach to which will also serve the purpose

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of acting as a groyne, for the protection of the shore line to the eastward, from further erosion by heavy seas.

On May 11, authority was given to proceed with this work, but owing to the difficulty found in securing a suitable foreman nothing was done before the end of the fiscal year.

## COLLINGWOOD.

Collingwood is situated on the south shore of Georgian bay, Township of Nottawasaga, County of Simcoe, ninety-four miles by rail from Toronto. It is the terminus of the Northern and Hamilton and North-western railway. There is an extensive trade in ship building, grain and lumber, and it is the starting point for the steamers for Owen Sound, Sault Ste. Marie and Parry Sound. Population, 5,000.

As constituted now, the harbour is very large and commodious, being protected on the north and east sides by extensive breakwaters.

At the last session of parliament the sum of \$40,000 was appropriated for harbour improvements at this place, and authority was given to employ Mr. C. S. Boone to do the dredging on September 4, 1903. Work was commenced on July 1, and closed for the season December 3. The dredge worked 1,488½ hours, removing 28,781 cubic yards of rock, 12,068 hard pan and 108 yards mud, and on special work, 2,703 yards rock working 130½ hours.

A contract was let to J. D. Conroy, of Peterboro', for an extension to the town wharf, and the rebuilding of the present structure. So far no work has been done on this contract.

Total expenditure for fiscal year, 1904-05, \$97,214.05.

## CORNWALL.

Cornwall, the chief town of the united counties of Stormont, Dundas and Glengarry, is situated at the mouth of the Cornwall canal, on the River St. Lawrence, on the line of the Grand Trunk railway, sixty-seven miles south-west of Montreal, and 105 miles east of Kingston. It is a port of entry. The Cornwall canal gives it excellent water privileges which are taken advantage of by several large mills and factories erected on its banks, among them: two cotton mills, two woollen mills, two grist-mills, one saw-mill, three planing mills and one sash and door factory. Population, 6,704.

During 1902-03, the 'Up River wharf,' situated on Crown land, opposite the canal bridge at the foot of Augustus street, on the River St. Lawrence, being extremely dilapidated, was removed to 1 foot below the extreme low water level, and rebuilt on a height of 5 feet and a length of 152 feet and 10 feet wide; at the downstream end, an extension 75 feet long, 10 feet wide and 13 feet high was built and sunk in 8 feet at low water; a return wing 66 feet long, 10 feet wide, was built to the shore; the whole well ballasted with stone.

The wharf is parallel with the shore, and has a total length of 227 feet, by a height of 13 feet, and stands in 9 feet at low water, with an icebreaker at its upstream end. The outer face is built with close-faced timber, 12 x 12 inches, laid to a batter of 1 in 12. The corners are protected with steel boiler plates ¾-inch thick.

The top is planked over for a width of 12 feet, from the outer face of the wharf, and the space between that floor and the shore has been filled in on the whole length to the level of the wharf with dredged materials, on which has been put a layer of gravel.

A storehouse, 12 x 18 feet, has been erected on the wharf and the road, from the bank of the canal, has been improved and put in good condition.

Dredging has been performed in front of the wharf on a length of 300 feet by a width of 24 feet and a depth of 4 feet.

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The work, carried out by day labour, was commenced in May and completed in June, 1903. Cost of construction, \$3,841.92; cost of dredging, \$960. Total cost \$4,801.92.

During the early spring of present fiscal year, the wharf having been slightly damaged by ice to the extent of some cap pieces and three tiers on downstream side being torn off, these were replaced at a cost of \$88.07. The wharf is now in good condition.

#### CUMBERLAND.

Cumberland village, in the County of Russell, is situated twenty miles below Ottawa and two miles south of Buckingham junction, on the Canadian Pacific railway. Besides the regular ferry service, the wharf provided for considerable traffic from passenger and freight boats plying on the River Ottawa.

At its session of 1904, parliament granted the sum of \$7,000 towards the construction of a wharf at this place.

The work was awarded by contract on May 31, 1901, for the sum of \$6,275. Preliminary work commenced in September, 1904, and construction was completed in March, 1905. The cost of inspection amounted to \$369.

The wharf consists of a double-deck landing pier, 30 feet by 90 feet on a very irregular rock bottom. There are two approaches 18 feet wide, 20 feet and 178 feet long respectively. The structure is of close-face cribwork, structural steel and dry masonry. Elevation of high-level flooring 15 feet above lowest water, at which stage a minimum depth of 8 feet is available for navigation.

On June 30, 1905, a further sum of \$421.77 had been expended on the addition of two slips and in procuring the materials required for a freight shed.

Expenditure during fiscal year 1904-05, \$7,298.50.

#### DEPOT HARBOUR.

Depot Harbour is situated on the north-east coast of Georgian bay, in the district of Muskoka, sixty miles north of Collingwood, and three miles by water from Parry Sound. It is the western terminus of the Canada Atlantic railway, lately acquired by the Grand Trunk railway; it is a point of transshipment for grain from the west; is distant from Ottawa, 263 miles by rail (for further description see report of 1903-04).

In May, 1902, a contract was awarded to Messrs. Davis, Haney & Miller for the construction of an extension to the elevator wharf towards Supply island, and a landing pier at the inner end of the harbour.

At the end of the fiscal year 1904-05, the extension, 525 feet long and 80 feet wide, was completed, and the landing pier 500 feet long with the approach, and 150 feet wide was nearly completed; there remaining only a small portion of the filling to be done, it has since been finished and accepted.

The amount expended during the fiscal year 1904-05, was \$99,110.34.

#### DUNNVILLE.

Dunnville is a prosperous town, situated on Grand river, five miles from Lake Erie, on the line of the Grand Trunk railway. Population about 2,000.

Owing to the dredging performed at entrance to the river at Port Maitland, and dredging at the town dock at this place, lake vessels are enabled to proceed up the river directly to town dock.

At intervals, during the months of July, August and September, 1904, the dredging of a channel, in Sunfish creek, about 45 feet wide and approximately 1,200 feet long to a depth of 11 feet was performed by Mr. C. S. Boone, of Toronto, to provide a suitable outlet for the drainage from the town to the river.

Expenditure will be found in Chief Accountant's report under the name of 'Grand River.'

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## ECHO BAY.

Echo Bay is a small village on the 'Soo' branch of the Canadian Pacific railway, and is distant 18 miles east of Sault Ste. Marie.

At the last session of parliament, the sum of \$5,000 was appropriated for the construction of a wharf at this place.

Plans and specifications were prepared for a structure to consist of a rubble stone causeway approach, 1,280 feet in length, and a pile wharf at outer end, 798 feet in length.

Tenders were called for, and a contract was let to Mr. Wm. Birmingham, Sault Ste. Marie, to construct the wharf, for the sum of \$17,450.

On February 18, authority was given to substitute pilework instead of a stoneway approach, at an additional cost of \$7,000.

Work was commenced on January 6, and is still under way.

Total expenditure for fiscal year 1904-05, \$5,015.25.

## GODERICH.

Goderich is situated on the shore of Lake Huron, at the mouth of the Maitland river, in the County of Huron, about 68 miles from Sarnia and 62 miles from London. It is the terminus of the Buffalo and Goderich branch of the Grand Trunk railway, and of the Guelph and Goderich branch of the Canadian Pacific railway, now under construction. Population about 5,500.

It is a place of considerable importance, making rapid advancements in manufactures and shipping.

On August 8, 1904, a contract was let to Messrs. Battle and Conlon, for the sum of \$74,000, to construct a breakwater 500 feet long and 35 feet wide, for the purpose of protecting the entrance to the harbour.

The breakwater is built of close face cribwork filled with stone ballast: the superstructure, which reaches to 8 feet above low water level, is composed of concrete walls and top, with stone filling between concrete cross-walls, built at 20 foot intervals throughout structure.

The above work was commenced on January 9, 1905, and by June 30, 1905, about one-half of the work was completed at an expenditure of \$38,945.

At the last session of parliament, the sum of \$20,000 was appropriated for repairs to piers, and dredging. The former being performed by day labour.

The work done on the piers consisted of the reconstruction of 1,013 feet of the superstructure of the north pier, to a height of 6 feet above low water level, and some slight repairs to the decking of the south pier.

Between August 5 and November 28, 1904, dredging was performed by the Marlton Dredging Company, of Goderich, in channel between piers and in inner harbour, at the rate of \$8 per hour; the time employed being 375 hours. The amount of material removed was 24,532 cubic yards.

From May 6 to June 24, 1905, dredging was again performed by the Marlton Dredging Company, between piers and in inner harbour, removing 21,376 cubic yards of clay, gravel and sand.

The total expenditure during the fiscal year 1904-05, amounts to \$35,147.32, including \$2,502.66 for dredging.

## GORE'S LANDING.

Gore's Landing is a small village of some 100 inhabitants, and is situated in the County of Northumberland on the south shore of Rice lake, 12 miles from Cobourg.

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At the last session of Parliament, the sum of \$1,000 was appropriated for repairs to the wharf at this place, and authority was given on June 15, 1905, to expend this amount.

Total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$115 00
Materials. . . . .	884 88
	<hr/>
	\$999 88
	<hr/>

#### GRAND BEND.

Grand Bend is situated on the shore of Lake Huron, at the mouth of Sauble river, about 15 miles from Exeter, which is the nearest station, on the Wiarton, Grey and Bruce division of the Grand Trunk railway, and about 30 miles south of Goderich.

A contract was awarded to the late Mr. John D. Warwick, of Brockville, on March 26, 1904, for the construction of wharf and approach to same for the sum of \$21,388. The actual construction was commenced about the middle of April, 1905, and by June 30, 1905, slightly more than half the work had been finished.

This wharf, when completed, will be 548 by 20 feet including 100 feet of stone approach. It is to be constructed of timber and composed of close cribbing, with continuous superstructure, the top of which will be about 6 feet above low water level. It will be of great commercial service, and provide a harbour of refuge.

In April, 1905, a contract was also awarded to the late Mr. J. D. Warwick for the dredging of entrance to the channel 50 feet wide, into the Sauble river. Up to June 30 this work had not been commenced.

The total expenditure during the fiscal year 1904-05, including superintendence, was \$11,378.00.

#### HAILEYBURY.

The town of Haileybury, on the west shore of Lake Temiskaming, is the first lake port on the route of the T. and N. O. Ry., 180 miles from North Bay. Naturally it links the rail and water traffic; navigation extends over a distance of 150 miles. It is 5 miles from Cobalt, the centre of an important mineral district.

In the fiscal year 1900-01, the building of a wharf was commenced to accommodate the local trade. The sum of \$2,000.22 was expended. No work of consequence was done during the fiscal year 1901-02, the expenditure being only \$84.50.

During the fiscal year 1902-03 active work of construction was resumed, the outlay was \$3,573.98.

During the fiscal year 1903-04, a landing head, 40 by 60 feet dimensions, of sheet pile understructure and open-face cribwork superstructure with stone filling was built to a height of 7 feet above L.W.L., incorporating a smaller crib, 20 by 30 feet dimensions which had been sunk in 10 feet of water at an earlier date. The stone approach, which is to be 516 feet in length and 16 feet wide at the top, was added to materially, but not completed to its full height. The expenditure for the fiscal year 1903-04 being \$6,895.41.

During the fiscal year 1904-05, the stone approach, having proved its worth as an ice-breaker, was completed to its full height of 12½ feet on 85 per cent of its length, and to 9 feet on the outer portion, 75 feet long. It has been found advisable to defer, for the time being, the placing of the full weight upon the foundation of the latter section, where some trouble had been caused by subsiding. The landing head was extended to its present dimensions of 111 feet frontage on a width varying from 20 feet to 50 feet, and raised to an average elevation of 10½ feet above L.W.L.

Expenditure for fiscal year 1904-05, \$6,005.74.

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Though not fully completed, this structure is gradually becoming the backbone of the most important harbour on the lake. In the fall of 1904, the freight for New Liskeard, 5 miles away, was handled three weeks after the close of navigation at that place. This condition is likely to recur often.

## HAMILTON.

Hamilton, a city of 50,000 inhabitants, is situated on the south side of Burlington bay, an arm of Lake Ontario.

At the last session of parliament the sum of \$30,000 was appropriated for harbour improvements at this place.

Plans were prepared for a revetment wall 1,855 feet in length, in the harbour and at the north end of the city, extending from St. Catharine street to Wentworth street, to be constructed of a double row of steel interlocking piles, filled with riprap and covered with a brick paved top, the estimated cost being \$116,000.

## HILTON.

Hilton is a small village situated on St. Joseph island, in the north channel of Georgian bay.

At the last session of parliament the sum of \$600 was appropriated for repairs to wharf at this place, and authority was given on September 10 to expend this amount.

Work was commenced on April 18, and finished on June 30, 1905.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence.. . . . .	\$ 232 31
Materials... . . . .	364 95
	<hr/>
	\$ 597 26

## HOLLAND RIVER.

Holland river is situated in the township of West Gwillimbury, and forms the boundary between the counties of York and Simcoe, forty-one miles north of Toronto. This river runs into Cook's bay, an arm of Lake Simcoe.

Authority was given on October 11 last, to expend the sum of \$600 in rebuilding the wharf at this place, 100 x 12 feet. Work was started on October 25 and completed on November 16, 1904.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence.. . . . .	\$ 314 12
Materials... . . . .	198 36
	<hr/>
	\$ 512 48

## HONORA.

Honora is a village on the east shore of Manitoulin island, district of Algoma, distant thirteen miles from Little Current.

At the last session of parliament, the sum of \$6,400 was appropriated to complete the wharf at this place.

A contract was let on February 22, 1904, to Messrs. Kastner & Porter, Wiarton, to construct this wharf for the sum of \$7,900. Work was continued on July 1 and completed on August 26.

Total expenditure for fiscal year 1904-05, \$8,074.

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## HUNTSVILLE.

Huntsville, a town of 1,500 inhabitants, is situated on the northern division of the Grand Trunk railway, 145 miles north of Toronto.

At the last session of parliament, the sum of \$500 was appropriated for the construction of an approach to the wharf at this place, and on September 10, authority was given to expend this amount.

Work commenced on October 1 last, and was completed November 4.

Total expenditure for fiscal year, 1904-05 :

Labour and superintendence. . . . .	\$208 25
Materials. . . . .	281 65
	<hr/>
	\$489 90

## KINCARDINE.

Kincardine, in the County of Huron, on the shore of Lake Huron, thirty-nine miles south of Southampton, and thirty-two miles from Goderich, is the terminus of the Wellington, Grey and Bruce division, of the Grand Trunk railway.

The principal industries are :—Two furniture factories, boiler and machine works, and salt works.

Population about 2,800.

At the last session of parliament, the sum of \$1,000 was appropriated for repairs to piers, &c., at this place, and on July 22, 1904, instructions were issued to proceed with this work, by day labour.

The repairs done consisted of the re-construction of about 100 feet of breast work on the south dock 8 feet in depth, the placing of 1,095 feet 8 x 10-inch oak and cedar waling on the south and east docks of basin, and planking.

The work was completed on October 27, 1904.

The total expenditure during the fiscal year 1904-05 :

Labour and superintendence. . . . .	\$448 94
Materials, timber, iron, &c. . . . .	550 76
	<hr/>
Total. . . . .	\$999 70

## LAKEPORT.

Lakeport (the port of Colborne), is situated on the north shore of Lake Ontario, fourteen miles east of Cobourg, in the west riding of Northumberland.

At the last session of parliament, the sum of \$2,300 was appropriated for repairs to wharf at this place, and authority was given on September 15 to expend the appropriation.

Work commenced on July 18, and closed down for the winter on November 26, and was resumed on June 12, and completed on June 30.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence. . . . .	\$1,848 51
Materials. . . . .	651 00
	<hr/>
	\$2,499 51

## LEAMINGTON.

Leamington is a thriving town situated on the shore of Lake Erie, in the County of Essex, about twenty-seven miles east of the mouth of the Detroit river, and on the line of the Père Marquette railway. Population about 1,500.

At the last session of parliament, the sum of \$4,200 was appropriated for repairs to wharf and for the construction of a warehouse. Authority was given to proceed



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with the work on September 10, 1904. Material was procured and work commenced October 24, 1904, continuing until November 5, and was resumed about the middle of April; it was still in progress on June 30, 1905.

The work done consisted of the driving of 240 running feet of sheet piling, 30 feet long and 8 inches thick, along face of pier towards outer end; the placing of 220 lineal feet of 9 x 12-inch waling and 45½ cords of stone filling. The warehouse, 15 feet by 50 feet was also partly constructed.

The expenditure during the fiscal year, 1904-05, was \$4,134.43.

## LION'S HEAD.

Lion's Head, a village of 500 inhabitants, is situated on the west shore of Georgian bay, 22 miles north of Wiarton, in the township of Eastnor.

Orders were issued on October 3, 1904, to expend the sum of \$500 in repairs to wharf, which had been damaged by fire.

Work was commenced on October 17, and was completed on November 3.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence. . . . .	\$140 00
Materials. . . . .	381 00
	<hr/>
	\$521 00

## L'ORIGINAL.

L'Original, a post village in Prescott county, on the south shore of the Ottawa river, 3 miles across the river from Calumet station on the Canadian Pacific railway and 66 miles west of Montreal. It contains, besides the county buildings, 4 churches, 1 telegraph office, several insurance agencies, grist and saw mills, three stores and three hotels. Two weekly newspapers are published in L'Original. Population, 1,000.

The wharf is the most important one, on the river, between Ottawa and Grenville, and is the only landing for the freight and passenger traffic of the village and to a large extent of the county. It was built a length of 534 feet under commissioners of the provincial government, prior to the union, in 1841. In 1876-77, it was found necessary, owing to the filling up of the bay, to extend it 800 feet or to a total length of 1,334 feet, including the outer block which is 30 feet long and 120 feet wide. The long approach to this outer block was built 22 feet wide, consisting of cribs 10 feet by 22 feet, united by platforms of an average span of 34 feet. The work was done by the municipality, aided by a grant of \$2,000 from the provincial government.

In the spring of 1884, part of the superstructure was carried away by ice, and rebuilt by this department in the years 1884, 1885, 1886 at a cost of \$7,266.49. The vote of 1884 was supplemented by a grant of \$1,000 from the municipality. The above amount also covers the expense of dredging done by the *Nipissing* in front of the piers during the seasons of 1884 and 1885.

In 1896-97, an examination of the wharf was made at a cost of \$191.15. It was found that the approach, being in a very dilapidated condition, could not long stand the constant travelling of heavy loads over its uneven roadway. Ten of the shore cribs had also been moved bodily from their original positions to distances varying from 3 to 22 feet, and part of eight others had been shifted from their position and heavily damaged. It was therefore decided to rebuild the whole approach, 1,323 feet long from shore to outer block, along the downstream side of former one. In June, 1897, a contract for the above was entered into with Messrs. J. N. Munroe and W. Murray, for the sum of \$13,417.12. It called for the construction of : 1. A stone and earth embankment 623 feet long and 25 feet wide at top with side slopes of 1 in 1 and built to an elevation of 19½ feet above extreme low water. 2. A trestle approach 700 feet long and 20 feet wide with bents 12 feet apart and composed of 6 piles,

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driven 15 feet in the ground and covered with 4-inch planks well secured to the floor stringers.

At the end of 1897-98, the contract work was not quite completed, there remaining yet a number of braces to be laid and secured on each side of the bents. During the year, the sum of \$13,850.27 was expended including the purchase of materials for the reconstruction, by day labour, of the outer block from low water level.

During 1899, the contract work was completed and work on the head block done as above. It was rebuilt to a height of 19 feet, a freight shed 40 by 20 feet and a waiting room 20 by 16 feet constructed on the wharf, and a pathway 3 feet wide, of 3-inch pine deals, placed for a length of 700 feet. The railing of the approach 1,360 feet long was painted. Total cost, \$6,009.12.

In 1900, minor repairs to the extent of \$59.95 were made.

During April, 1904, the floor of the trestle approach, 700 feet long, was redoubled with 3-inch pine plank, the roof of the freight shed repaired and the stone embankment, 623 feet long, regavelled. The whole at a cost of \$974.52.

In February, 1905, some piles and braces having been damaged by the ice, these were repaired at a cost of \$43.78.

## MCGRAKEN'S LANDING.

McCraken's Landing is situated on the south shore of Stony lake, in the County of Peterborough, and is distant 12 miles north-easterly from Lakefield, on the Trent valley system.

At the last session of parliament, the sum of \$900 was appropriated for repairs and improvements at this place, and authority was given on September 10th to expend this amount.

Work was commenced on November 1 and closed down for the winter on November 18, and was recommenced on January 12 and was completed January 31.

The work consisted in building an additional pier, 15 by 40 feet by 11 feet.

Total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$296 86
Materials. . . . .	483 01
	<hr/>
	\$781 87

## MALLORYTOWN.

Mallorytown is a small town on the main line of the Grand Trunk railway, and is distant 14 miles west of Brockville, in the County of Leeds.

At the last session of parliament, the sum of \$3,300 was appropriated for a landing pier and dredging at this place and authority was given on September 10 to expend this amount.

It appears that the landing pier was built by the Department of the Interior, but, owing to high water, there was no way of getting to Bridge island, on which the wharf was located.

Authority was given on October 31, to expend the sum of \$1,000 in constructing a causeway approach.

Work was commenced on December 1, and closed down for the season on December 23 for the winter, and recommenced on January 2 and was completed March 31.

An extra \$500 was granted on April 17, 1905, to complete roadway.

Total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$857 00
Materials. . . . .	142 04
	<hr/>
	\$999 04

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## MEAFORD.

Meaford is an incorporated town in the County of Grey, on the west side of Georgian bay, 18 miles west of Collingwood, and 20 miles to the eastward of Owen Sound. It is the terminus of the northern division of the Grand Trunk railway. Population, 2,500.

At the last session of parliament, the sum of \$22,000 was appropriated for a new breakwater pier, and \$3,000 for repairs at this place; authority was given to expend the amount for repairs (\$3,000) on July 22 last. Work was commenced on September 14, and closed for winter on November 15, recommencing May 15 was continued to June 30, when work was finished.

The work consisted in building 140 feet of new superstructure, 19 feet 6 inches wide and 4 feet 4 inches high on the old breakwater.

On August 23, 1904, a contract was let to Messrs. Gastner & Porter, of Wiar-ton, for the sum of \$59,800, for the construction of the breakwater pier. Work was commenced on April 6, and is still in progress.

Total expenditure for fiscal year 1904-05, \$20,505.81.

## MIDLAND.

Midland, Simcoe county, is the terminus of the Midland division of the Grand Trunk railway on Georgian bay. Population, 3,500. Large quantities of lumber are shipped to and from this harbour, and the railway company has two large grain elevators at this place. There is also a large smelting works in operation.

At the last session of parliament the sum of \$16,000 was voted for improvements at this place.

Work was continued by the Owen Sound Dredging Company's plant in deepening the harbour mostly in the neighbourhood of the Esplanade. The dredge worked from July 1 to December 3, and from May 8 to June 30, and during that time removed 65,112 cubic yards, working 2,059 hours.

A ledge of rock projecting from under the Esplanade dock was removed by blasting, at a cost of \$947.90.

Work was continued on the contract let to Angus A. McDonald, on November 2, 1903, for the sum of \$19,492 for the construction of two wharfs which were finished on October 12, 1904.

Total expenditure for fiscal year 1904-05, \$38,099.37.

## NEWCASTLE.

Newcastle is situated in the County of Durham, on the north shore of Lake Ontario, forty-seven miles east from Toronto. It contains large woollen mills, a tannery and implement factory. Population about 1,000.

At the last session of parliament the sum of \$7,000 was appropriated for repairs at this place, and on July 7, authority was given to expend the amount by day labour.

Work was commenced on August 1, and continued up till November 5 when work closed down for the winter, recommencing on May 1 and finishing on June 19.

The work consisted in the construction of a crib 30 x 30 feet at extreme south end of breakwater; the rebuilding of 250 feet of cribwork, 15 feet wide, at north end of breakwater, and the construction of 525 feet of sheet piling.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence. . . . .	\$ 1,075 25
Materials. . . . .	5,924 75
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	\$ 7,000 00

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## OAKVILLE.

Oakville, a small town of about 500 inhabitants, is situated on the north shore of Lake Ontario, twelve miles west of Toronto, in the County of Halton.

Authority was given on September 15 last, to expend \$850 for the construction of a small crib, 40 x 20 x 8 feet and approach between east pier and shore at this place.

Work was commenced on October 14, and closed down for the winter on December 31, recommencing on June 19 and was completed on June 26.

Total expenditure for fiscal year 1904-05, \$781.48.

## OLIPHANT.

Oliphant is a district, or post office centre, on Lake Huron, in the County of Bruce, on the south end of what is known as the 'Bruce Peninsula' and is eight miles distant from Wiarton. It is the principal point of communication between the main land and the adjacent 'fishing islands.'

At the last session of parliament, the sum of \$1,000 was appropriated for the construction of a wharf at this place, and on September 10, 1904, instructions were given to proceed with this work by day labour. Materials were secured and work commenced on November 14, 1904, and continued until completion on June 28, 1905.

The length of wharf constructed is 600 feet, the first 540 feet from shore being built of dry masonry 10 feet wide, with a top coating of gravel and runs from 1 to 6 feet deep, with an average height of 2 feet above ordinary high water mark. The outer end consists of cribwork, filled with stone ballast and decked with 2-inch plank. The inner portion of cribwork is 40 feet long by 12 feet wide and the outer end forms a 'T,' 20 feet square.

The total expenditure for the fiscal year 1904-05:

Labour and superintendence....	\$893 12
Materials, timber, iron, stone, &c..	83 06
	<hr/>
	\$976 18

## OSHAWA.

Oshawa is a town of some size situated on the north shore of Lake Ontario, in the County of Ontario, on the main line of the Grand Trunk Railway, thirty-four miles east of Toronto.

Authority was given on September 10, to expend the sum of \$700 in repairs to sheds at this place.

Work was commenced on May 10 and was completed June 24.

Total expenditure for fiscal year 1904-05 :—

Labour and superintendence..	\$198 85
Materials..	501 15
	<hr/>
	\$700 00

## OWEN SOUND.

Owen Sound is situated at the mouth of the Sydenham river, which flows into the head of Owen Sound, an arm of the Georgian bay, in the County of Simcoe.

The town is the centre of an extensive agricultural district, and is the terminus of the Grand Trunk railway branch of the Georgian Bay and Lake Erie division, also the Canadian Pacific railway, Toronto, Grey and Bruce division. There are several lines of steamers running to and from Owen Sound. Population, 9,500.

At the last session of parliament, the sum of \$25,400 was appropriated for dredging and pile protection work at this place.

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Authority for dredging was given on May 11, and authority to expend \$2,000 for extra anchor piles on west side of harbour, on September 10.

Dredging commenced July 1, and closed for season on December 10, recommencing May 18, and continuing to June 28. The dredge worked 1,969½ hours, removing 180,525 cubic yards of material.

Eighty extra anchor piles were placed in position behind new pile work on west side of the harbour at a cost of \$19.50 each, amounting to \$1,560.

Total expenditure for fiscal year 1904-05, \$33,591.08.

## PARRY SOUND.

Parry Sound is situated on the east shore of Georgian bay, in the District of Parry Sound, population, 1,000.

At the last session of parliament, the sum of \$8,000 was appropriated for the construction of a wharf at this place.

A contract was let to Mr. Angus A. McDonald on April 17, for the sum of \$8,925, for the construction of the wharf.

Work was commenced on April 4, 1905, and is still in progress.

No payments have yet been made on account of this work.

Total expenditure for fiscal year 1904-05, \$227.70.

## PEMBROKE.

Pembroke, in the north riding of the County of Renfrew, is on the south shore of Allumette lake, which is a part of the Ottawa river. It is an important station on the Canadian Pacific railway and of the Grand Trunk railway, 104 miles west of Ottawa. A steamer runs daily from Pembroke to Des Joachims, a distance of 45 miles. Population, 9,000.

On February 19, 1904, a contract was entered into with the W. J. Poupore Company, for the construction of a wharf opposite the town, at the foot of Albert street.

The structure consists of pile bents, 20 feet wide on a length of 1,342 feet, forming the approach, and a landing head of a total length of 550 feet, 50 feet wide, also of pile bents, with the outer face in 8 feet of water at low water level. The outer face of the part which is 50 feet wide is built with close sheet piles, the top of the wharf is 8 feet above low water level, except at the point where it crosses the Canadian Pacific railway trestle work, where it is 6 feet higher, with slopes both ways from that point. There are five landing slips at the outer end, and a combined freight shed and waiting room was built on the head of the wharf.

The work was commenced in the month of August, 1904, and completed in June, 1905.

The amount expended was \$43,105.50.

## PENETANGUISHENE.

Penetanguishene, in the County of Simcoe, is situated on the north-western peninsula in Georgian bay, formed between Nottawasaga bay and the water of the Severn river, 40 miles north-west of the town of Barrie.

It is the terminus of a branch of the Grand Trunk railway, and a large quantity of lumber is shipped thence from the north and east shores of the Georgian bay.

At the last session of parliament, the sum of \$22,000 was appropriated for dredging at this place, and authority was given May 14 to continue with the work which commenced on July 1, and ceased for the season on November 26, commencing again on May 8, and finishing on June 28. The dredge worked 1,738 hours removing 96,684 cubic yards.

Authority was given on December 13, to expend the sum of \$1,200 in repairs to lighthouse pier, and work commenced on January 23, and was completed on May 13.

Total expenditure for fiscal year 1904-05, \$12,743.52.

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## PETEWAHA.

Petewawa, in the County of North Renfrew, is on the south shore of the Ottawa river, near the mouth of the Petewawa river, 9 miles west of the town of Pembroke; it is a station on the Canadian Pacific railway. Population about 150.

The place had been chosen for the establishment of the permanent military camp, for which it is admirably adapted.

During the session of parliament of 1904, the sum of \$6,000 was voted for the construction of a wharf, one-half of a mile below the mouth of the Petewawa river, to facilitate the landing of freight and passengers from the daily line steamer from Pembroke.

On December 26, 1904, a contract was entered into with Messrs. Lemoine and Fortin, of Pembroke, for the construction of the wharf. Work was commenced in February and completed in April, 1905.

The wharf has a total length of 450 feet, 20 feet wide for a length of 420 feet, the head is 125 feet wide; the outer mooring face stands in 8 feet of water at extreme low water. The wharf is built of pile bents, placed 15 feet apart in the approach and 12 feet 6 inches centre to centre in the head, driven 12 to 18 feet in the sand bottom. The piles are capped with 12 by 12-inch timbers on which 12 by 12-inch stringers are placed, 4 feet centre to centre, the top covering consists of 3-inch planks.

An opening 40 feet wide was left in the approach for the passage of logs, under the flooring of the wharf, this opening is spanned by a bridge.

The total cost of the work was \$5,995.87.

## PIKE CREEK.

Pike Creek is a village in the County of Essex, situated on branch line of the Grand Trunk railway, on the south shore of Lake St. Clair, 10 miles east of the town of Windsor. Population about 200. The principal industry is farming, although considerable fishing is done at the creek.

At the last session of parliament, the sum of \$3,150 was appropriated for improvements at mouth of creek, and on October 18, 1904, authority was given to proceed with the work by day labour.

The work was commenced on November 1, 1904, and consisted in the construction of 95 feet of cribwork protection, and 64 feet of pile protection work on the westerly entrance to the creek; also 250 feet of crib and pile protection work on the easterly side of entrance.

The construction of the above work now renders Pike creek available as a harbour of refuge, for smaller craft, and what is more important, keeps this outlet open to the lake, and thus prevents considerable damage being done, during freshets, to the country to the south which is drained by this creek.

The total expenditure during the fiscal year 1904-05:

Labour and superintendence. . . . .	\$ 1,515 48
Materials, timber, iron, &c. . . . .	1,633 95
	<hr/>
	\$3,149 43

## POINT AUX BARIL.

Point aux Baril is a summer resort and fishing station among the islands of Georgian bay, thirty-eight miles north-west of Parry Sound. Steamers call tri-weekly at this place.

At the last session of parliament, the sum of \$3,000 was appropriated for improvements to the steamer channel between Parry Sound and Killarney, and authority was given on July 22, 1904, to expend the appropriation.

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Work was started on August 1 and was completed September 29 and consisted in the blasting out and removal of the shoal at Devil's Elbow, which was 137 feet long, with an average width of 36 feet and averaged  $5\frac{1}{2}$  feet of rock removed.

Total expenditure for fiscal year 1904-05, \$3,729.54.

## PORT ARTHUR.

Port Arthur is situated on Thunder bay, Lake Superior, in Thunder Bay district. It is the terminal of the Canadian Northern railway. Population, about 2,000.

At the last session of parliament, the sum of \$5,000 was appropriated for repairs to breakwater at this place, and authority was given on July 1, to expend the amount.

Work commenced on July 7, and was completed on September 2, and consisted in repairs to north-east end of breakwater.

Total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$ 709 13
Materials. . . . .	4,279 23
	<hr/>
	\$4,988 36

## PORT BRUCE.

Port Bruce is situated at the mouth of Catfish creek, in the County of Elgin, about five miles south of Aylmer. Population about 100.

The principal industry is fishing, in pursuance of which it ranks as an important point; between \$15,000 and \$20,000 worth of fish is taken annually from this port.

At the last session of parliament the sum of \$1,000 was appropriated for the construction of superstructure at the east pier, and on August 6 orders were issued to proceed with the work by day labour.

Some 236 feet of superstructure was rebuilt.

The total expenditure during the fiscal year 1904-05, being as follows:—

Labour and superintendence. . . . .	\$ 315 00
Materials, timber, iron, &c. . . . .	660 54
	<hr/>
	\$ 975 54

## PORT BURWELL.

Port Burwell is a harbour of refuge, situated on the north shore of Lake Erie, in the County of Elgin, about twenty-one miles east of Port Stanley and fourteen miles south of Tilsonburg. It is the terminus of the Tilsonburg, Lake Erie and Pacific Railway Company. Population about 500.

On June 8, 1905, the dredging of channel between piers and at the entrance to the harbour was started by the Dominion Dredging Company, and up to June 30, 1905, 18,990 cubic yards of quicksand were excavated.

The expenditure during the last fiscal year amounted to \$30,576.74, including the cost of extension to the breakwater.

## PORT COLBORNE.

Port Colborne is situated on the north shore of Lake Erie, in the County of Welland, about twenty miles west of the City of Buffalo. It is the terminus on Lake Erie, of the Welland canal, and as such is a point of great importance in connection with the transportation of grain and other freight from the west to the St. Lawrence ports.

With a view of utilizing the Welland canal to a greater extent, the government of Canada decided in 1901 to improve the harbour of Port Colborne, in such a way



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that it might be available as a transfer point for all kind of freight, from the largest vessels plying on the great lakes to canal-size steamers, and for this purpose the Department of Railways and Canals has been entrusted with the construction of docks, elevators and other terminal facilities, while the Department of Public Works has undertaken the construction of two breakwaters required for the protection against storms of the commercial docks.

The first or western breakwater was practically completed in June, 1904. Its total length being 4,424 feet; the outer 2,400 feet being 50 feet in width, and the remainder 25 feet in width, the height of the break being 11 feet above low water. The structure was built of timber cribwork, but the whole of the covering is concrete  $1\frac{1}{2}$  feet in thickness. At the outer end a block 100 feet long by 60 feet wide and 13 feet above low water, carries a concrete lighthouse, built by the Department of Marine and Fisheries. Along the south or exposed face, is deposited a stone embankment reaching to a height of 1 foot above low water.

During the fiscal year 1904-05, 3,000 cubic yards of large stone was added to this embankment, at a cost of \$9,000.

A further addition of 12,000 cubic yards of large quarried stone is required to complete this embankment and form, on the south side of the breakwater, the slope required to protect the structure against ice and westerly storms.

The second or eastern breakwater is located to the east of the entrance to the harbour and canal; the gap between the two breakwaters being 600 feet. This eastern breakwater will, when completed, afford effectual protection to the commercial docks, against easterly storms.

The structure is 2,400 feet in length and 35 feet in width; the understructure to within one foot of low water mark being of timber cribwork while the superstructure to a height of 11 feet above low water mark is of concrete cribwork, well filled with stone ballast.

The contract for this second breakwater was awarded to Mr. M. J. Hogan, on June 8, 1904, for the sum of \$179,000 and work was commenced early during the fiscal year 1904-05.

On June 30, 1905, twenty cribs each 100 feet in length and 35 feet in width had been sunk in position, were fully ballasted with stone, and ready to receive the concrete superstructure. At that date, the superstructure had been commenced, about 10,000 cubic yards being completed.

The payments made to the contractor, in connection with the construction of this breakwater, during the fiscal year amount to \$121,187.28.

Considering the very exposed position of the structure the progress made by the contractor has been entirely satisfactory.

#### PORT DOVER.

Port Dover is situated, on the north shore of Lake Erie, about 40 miles south-east of Woodstock, and about 50 miles west of Port Colborne. It is the terminus of the Georgian bay and Lake Erie division, and Port Dover and Hamilton division of the Grand Trunk railway. Population about 1,200.

At the last session of parliament, the sum of \$10,000 was appropriated for harbour improvements and repairs to piers. Authority was given to proceed with this work by day labour, on September 13, 1904.

The work done during the fiscal year consisted in the renewal, from low water level, of 100 feet of the superstructure of the easterly pier; 857 feet of the superstructure of the westerly pier; and the decking of the remainder of the westerly pier.

The total expenditure during the fiscal year 1904-05 :—

Labour and superintendence. . . . .	\$2,476 28
Materials, timber, iron, stone, &c. . . . .	6,714 23
	<hr/>
	\$9,190 51

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## PORT HOPE.

Port Hope is situated in the County of Durham on the north shore of Lake Ontario, 63 miles east of Toronto, on the Grand Trunk railway, and has a population of 4,188. Chief trade is in lumber and grain.

At the last session of parliament, the sum of \$4,000 was appropriated for repairs to piers and dredging at this place, and authority was given on July 7, to expend the appropriation.

Work was commenced on July 1, and closed down for the winter on November 30, recommencing on April 10, and finishing on April 26.

The following repairs were made; east pier, 600 feet in length, 16 feet in width. Centre pier, 145 feet in length and 12 feet in width. West breakwater, 375 feet in length and 20 feet in width.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence. . . . .	\$1,767 25
Materials. . . . .	2,232 74
	<hr/>
	\$3,999 99

## PORT MAITLAND.

Port Maitland is a harbour of refuge on the north shore of Lake Erie, at the mouth of the Grand river, 5 miles south of the town of Dunville, and about 15 miles west of Port Colborne. Considerable fishing is done at this point; it is also a summer resort. Population, about 100.

At the last session of parliament, the sum of \$10,000 was appropriated for dredging at this point. Dredging was performed to a depth of 18 feet below low water level, during the months of July and August, by Mr. C. S. Boone, contractor, of Toronto, removing a bar at entrance to harbour; also removing a sunken wreck in harbour, which had been a menace to vessels entering this port.

Expenditure will be found in Chief Accountants Report under the name of 'Grand River'.

## PORT STANLEY.

Port Stanley is an important harbour of refuge on the north shore of Lake Erie, at the mouth of Kettle creek, in the County of Elgin, 8½ miles, by rail south of the city of St. Thomas; it is the terminus of the Père Marquette railway, which brings in a large quantity of coal to this point from Conneaut, on the American side. Considerable fishing is done from this point and it is a favorite summer resort. Population, about 800.

At the last session of parliament, \$50,000 was appropriated for improvements to the harbour. On October 14th, 1904, authority was given to expend the sum of \$2,700 for repairs to the west pier, and the construction of close piling work, at inner end of harbour, all to be done by day labour.

On May 9, 1905, further authority was given to expend an additional \$2,400, for close piling, making total expenditure authorized \$12,100.

The work done consisted of the renewal, in timber, from low water level, of 330 feet of the superstructure of westerly pier, and the partial construction of 203 feet of close piling; as well as slight repairs to different portions of piers.

During the months of October and November, 1904, dredging was performed in the channel, between piers, by C. S. Boone, of Toronto, at the rate of \$12 per hour. The total number of hours worked being 534, during which time 33,424 cubic yards of clay and sand were removed, at a cost of \$6,586.80.

On April 10, 1905, dredging was resumed by Mr. C. S. Boone, with the agreement of payment by scow measurement, and up to June 30, 1905, 89,476 cubic yards were excavated, at a cost of \$15,450.01.

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Dredging was still in progress at the end of the fiscal year. Work done consisted in the dredging of the inner harbour and of the channel between government piers, so as to facilitate the entrance of the larger craft into this harbour; also, to render available for use the entire frontage of the piers built.

A small amount of dredging was also done at the entrance to Père Marquette Railway Company's slip.

Survey and plans were made for the construction of two breakwaters, each 500 feet long, at the outer entrance to piers, and tenders were called for.

The expenditure for the fiscal year 1904-05 was as follows:

Construction. . . . .	\$ 9,657 93
Dredging. . . . .	8,609 20
	<hr/>
	\$18,267 13

#### RICHARD'S LANDING.

Richard's Landing is a small village on the north shore of St. Joseph' island, in Georgian bay. It is distant nine miles by water from Desbarats, the nearest railway point.

Authority was given on September 29 last to expend \$100 in minor repairs to the wharf at this place.

Work was commenced on September 29 and completed on November 26.

Total expenditure for fiscal year 1904-05:

Labour and superintendence. . . . .	\$ 55 20
Materials. . . . .	44 71
	<hr/>
	\$ 99 91

#### RONDEAU.

Rondeau is situated in the County of Kent, at Pointe aux Pins, on the north shore of Lake Erie, about 140 miles west of Port Colborne. It is an important harbour of refuge on this side of the lake. The beach at Rondeau has become a favourite summer resort. It is the terminus of the Père Marquette railway, which have established a dock for lake ferry to deliver coal brought in cars from Conneaut, Ohio.

At the last session of parliament the sum of \$25,000 was appropriated for the construction of breakwaters at entrance to the harbour and \$5,000 for improvements to piers. The latter to be performed by day labour.

In regard to breakwaters, plans and specifications were prepared and tenders called for.

On July 7, 1904, instructions were issued to proceed with the work on piers which consisted of adding an additional 2 feet to 307 feet of the inner end of west pier to raise it to the same level as the remainder of this pier; also, the extreme inner end of this westerly pier, which had sunk about 4 feet was built up to former height, new snubbing posts were erected along this inner end, and twelve white oak spring piles were driven as a protection against the heavy coal boats coming in at this place. Some 500 running feet of white oak sheet-piling, 8 inches thick and 20 feet long, were driven at the westerly side of the west pier, starting at north or inner end. This piling was driven to prevent the sand from sifting through the pier and forming bars in the channel.

In June, 1905, a contract was let for the dredging of the inner harbour to 23 feet below low water level, and instructions were given to proceed with the work on June 19. On June 30, 1905, 11,750 cubic yards of clay and sand were excavated at a cost of \$1,910.

The total expenditure during the fiscal year 1904-05, amounted to \$14,716.75, including \$5,134.59 for dredging.

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## ST. JOSEPH.

St. Joseph is situated on the east side of Lake Huron, about 14 miles south of Goderich. Population about 100.

During the session of parliament of 1902, the sum of \$5,000 was appropriated towards building a wharf, by day labour, at this place.

Up to December, 1902, the wharf and approach were partly constructed, when the grant was expended. In 1903, contract was let to Mr. J. A. Cory, Ottawa, for the completion of the wharf, for the sum of \$3,950.50. Since this contract was let work has been proceeded with in a desultory manner, and up to the end of the fiscal year 1904-05, was only two-thirds completed.

The expenditure on this work during the fiscal year 1904-05, was \$275.

## SARNIA.

Sarnia is situated on the east bank of the St. Clair river about 3 miles from Lake Huron, in the County of Lambton, and is 59 miles from London, by rail. There are two lines of the Grand Trunk railway and one of the Père Marquette railway entering the town. Population, about 8,000.

It is a port of call for a number of lines of steamers and an important shipping point.

Authority was given on October 14, 1904, to expend the sum of \$1,200 for dredging at the Sarnia Saw Mills Company's works. Work was commenced on October 20, and completed on October 29, 1904, at a cost of \$1,170, including inspector's wages.

On May 18, 1905, authority was given to proceed with dredging at this place, the work to be done under contract with The Sarnia Bay Lumber, Timber and Salt Company.

From June 19 to 29, 1905, inclusively, dredging was performed in front of the Père Marquette railway dock, to a depth of 21 feet to give sufficient water for boats to unload rails at this dock. In the performance of this work 9,520 cubic yards of clay was removed, at a cost of \$1,648.40, including inspector's wages.

The total expenditure at this point during the fiscal year 1904-05, amounted to \$2,818.40.

## SAUGEEN RIVER.

Saugeen river empties into Lake Huron, at a point about 32 miles from Walkerton and 43 miles from Sarnia, and on this river is situated the thriving town of Southampton. Considerable traffic is carried on from the docks at this point, it is also an important fishing point.

At the last session of parliament, the sum of \$10,000 was appropriated for improvements at mouth of river.

On September 10, 1904, authority was given for the expenditure of \$4,000 for construction by day labour of sheet piling, &c., on southerly side of harbour. Work was commenced on October 1, 1904, on May 9, 1905, further authority was given for the expenditure of \$2,500 to complete sheet piling, referred to above.

The work done consisted of the construction of 373 running feet of close piling, on the south side of the harbour; also the renewal of 120 feet of the superstructure of cribwork, 24 feet wide, on same side of harbour, and the filling behind the whole of this work.

This work was not completed on June 30, 1905.

On June 1, 1905, dredging operations were commenced by Mr. A. F. Bowman, and up to the 30th of the same month, 25,830 cubic yards of material had been excavated in dredging in the inner harbour and in the channel at entrance to harbour to a depth of 18 feet below low water level.

The total expenditure during the fiscal year 1904-05, amounted to \$6,407.13.

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## SAULT STE. MARIE.

Sault Ste. Marie is situated at the head of St. Mary's river, which connects Lake Superior with Lake Huron.

At the last session of parliament, the sum of \$24,000 was appropriated for harbour improvements and dredging at this place.

A contract was let to Mr. Joseph Battle, Thorold, on April 12, for the construction of an extension, 300 feet long and 60 feet wide, with an 'L' 250 feet long and 50 feet wide, for the sum of \$65,000, to the government wharf at this place.

The work was constructed of cribwork up to low water level with concrete superstructure, and was commenced on April 12, and completed on November 15.

Authority was given on May 4, 1905, to expend the sum of \$300 for removal of boulders near wharf. Six days work was performed at a cost of \$240.

Total expenditure for fiscal year 1904-05, \$61,710.45, including \$7,000 paid to W. H. Plummer.

## SEVERN RIVER.

Severn River runs north-westerly from the head of Lake Couchiching to Georgian bay, and forms the outlet of the Trent Valley canal system to the north.

At the last session of parliament, the sum of \$2,000 was appropriated for improvements at this place, and authority was given September 10, to expend the appropriation.

This work was divided into two parts, \$1,500 being allowed for widening the river and putting in a new stopping dam at Washago, and \$500 for the removal of rock and boulders in the river, in the township of Rama.

Work was started at Washago on November 21, and finished February 25, 1905, and work started at Rama township on November 15, and was completed on December 21.

An additional \$500 was granted on May 5, to continue work in township of Rama, but owing to high water no expenditure has yet been made.

Total expenditure for fiscal year, 1904-05 :

Labour and superintendence (Washago) . . . . .	\$1,154 66
Labour and superintendence (Rama) . . . . .	450 39
Materials (Washago) . . . . .	344 47
Materials (Rama) . . . . .	29 75
	<hr/>
	\$1,979 27

## SEVERN RIVER.

*(McDonald's Chute.)*

At the last session of parliament, the sum of \$3,400 was appropriated for removal of obstructions at McDonald's Chute on the Severn river, and authority was given on September 10 to expend the appropriation.

Work was commenced on October 14 and completed on February 28, 1905.

Total expenditure for fiscal year, 1904-05 :

Labour and superintendence . . . . .	\$2,303 84
Materials . . . . .	1,096 61
	<hr/>
	\$3,400 45

## SHREWSBURY.

Shrewsbury is a small village on the north shore of Rondeau bay, in the County of Kent, 20 miles south-east of Chateau, and 5 miles south of Blenheim; it is the centre of a farming district.

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At the last session of parliament, the sum of \$3,300 was appropriated for the construction of a wharf at this place, and on September 10, 1904, instructions were issued to proceed with the work, which was completed on June 10, 1905.

The work done consisted of the construction of a pile wharf 296 feet long including the 'L' at outer end, which is 32 feet square, the remainder of the wharf being 16 feet wide. The approach is 32 feet long and 16 feet wide, and is composed of earth and gravel with 3-inch plank on sides, supported by piles.

The total expenditure during the fiscal year 1904-05, was as follows :

Labour and superintendence. . . . .	\$ 875 99
Materials, timber, iron, &c. . . . .	2,182 80
Total. . . . .	\$ 3,058 79

## SOUTHAMPTON.

Southampton is an incorporated town, situated at the mouth of the Saugeen river, on the east shore of Lake Huron, in the County of Bruce, 32 miles from Walkerton, the county town; it is the terminus of a branch of the Grand Trunk railway.

Has three furniture factories and does a progressive business in lumber, ties, posts and fishing, besides being a summer resort of note.

On December 5, 1904, the sum of \$600 was authorized to be expended on urgent repairs to the breakwater at Chantry island. The work consisted of sheathing 240 feet of the face of the breakwater; re-enforcing the corners with sheathing and iron bands; patching face work and renewing a considerable portion of decking.

This work was commenced on March 27, and was completed by May 17, 1905.

The total expenditure at this point during the fiscal year 1904-05, was :

Labour and superintendence. . . . .	\$ 226 79
Materials, timber, iron, &c. . . . .	373 06
	\$ 599 85

## STOKES BAY.

Stokes Bay, a village of 150 inhabitants, is situated on the east shore of Lake Huron, in the township of Eastnor, County of Grey, and is distant 42 miles north-west of Wiarton, the nearest railway point.

At the last session of parliament, the sum of \$7,500 was appropriated for a wharf at this place, and authority was given on August 16, to prepare plans and specifications.

A contract was let to Messrs, Kastner and Porter, of Wiarton, for \$8,500 on November 28, 1904.

The contract was completed and final estimate given on April 29, 1905.

Total expenditure for fiscal year 1904-05, \$7,478.61.

## TENBY BAY.

Tenby Bay is a farming settlement on the south shore of St. Joseph's island, Lake Huron.

At the last session of parliament, the sum of \$500 was appropriated for the construction of a wharf, 245 feet in length, composed of stone approach 145 feet by 18 feet and pile wharf 100 feet in length, with block end 35 by 50 feet ; authority was

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given on September 10 to expend the amount by day labour. Work commenced on October 25, and was finished on November 17, 1904.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence . . . . .	\$637 32
Materials . . . . .	74 36
	<hr/>
	\$711 68

## THESSALON.

Thessalon is situated on the north side of the north channel of Lake Huron, in the District of Algoma, fifty miles east of Sault Ste. Marie. Considerable lumber is shipped from this place.

At the last session of parliament, the sum of \$17,500 was appropriated for the construction of a breakwater.

The work consists of a breakwater 420 feet in length with an 'L' end of 8 feet made up as follows :

Stone approach 80 feet cribwork 340 feet long 20 feet wide, and an 'L' end of 80 feet, 25 feet wide.

A contract was let on July 14, to Messrs. O'Boyle Bros., for the sum of \$12,000, work was commenced on August 20 and is still in progress.

Total expenditure for fiscal year 1904-05, \$18,026.87.

## THORAH ISLAND.

Thorah island is situated in Lake Simcoe, three miles from Beaverton, the nearest railway point.

At the last session of parliament, the sum of \$660 was appropriated for harbour improvements at this place, and authority was given on September 10 and 26, to expend this amount by day labour.

The work consists in the construction of two rows of pile work, one on the north side 30 feet long, and one on the south side, 40 feet long, of the dredged channel.

Work commenced on February 17, and stopped March 31.

Total expenditure for fiscal year 1904-05 :

Labour and superintendence . . . . .	\$198 00
Materials . . . . .	196 42
	<hr/>
	\$394 42

## THORNBURY.

Thornbury, an incorporated village in Grey county is situated at the mouth of the Beaver river, which empties into Georgian bay, and is on the Meaford branch of the Grand Trunk railway, eight miles from Meaford and nineteen miles from Collingwood. Population, 1,000.

At the last session of parliament, the sum of \$1,500 was appropriated for repairs at this place, and authority was given July 22 to expend the amount by day labour.

Work was commenced on September 10, and was completed June 6; it consisted in rebuilding the outer end of main piers, 100 x 35 feet, also building a new superstructure on inner breakwater 70 x 12 x 8 feet.

Total expenditure for fiscal year 1904-05, \$1,500.08.

## TORONTO.

Toronto harbour is situated on the north shore of Lake Ontario, and is formed by a circular bay  $1\frac{1}{2}$  miles in diameter, separated from the lake by a large island



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(formerly a peninsula) about 6 miles long, making a safe and well-sheltered harbour capable of containing a large number of vessels.

At the last session of parliament, the sum of \$28,000 was appropriated for work at eastern channel, and \$40,000 for extension of island breakwater. Authority was given on July 7, to expend the \$28,000; work commenced on July 1, was continued till June 30, and consisted in rebuilding 1,000 feet of superstructure of east pier northwards from lighthouse, 30 feet in width and 5 feet in height.

A small amount of dredging was done in removing a small shoal, 4,615 cubic yards of material.

Repairs were made to the stone talus protecting the breakwater for a distance of 700 feet.

Plan and specifications were prepared and tenders were called for extension to breakwater, but up to June 30, the work had not been let.

Total expenditure for fiscal year 1904-05, \$29,831.03.

## TREADWELL.

Treadwell is a post village in Prescott county, on the south shore of the River Ottawa, 4 miles north of Plantagenet, on the Canadian Pacific railway, 41 miles east of Ottawa. Population about 225.

The old Cane and Brown wharfs, in this locality, private property, being in a very dilapidated condition and the proprietors reluctant to undertake the extensive repairs found necessary to accommodate the heavy traffic from Plantagenet and surrounding parishes, the government decided to build a new wharf in this locality. To this effect, Brown's wharf, including a 30 feet wide and 250 feet long right of way thereto, was bought and transferred to the Crown for the sum of \$600.

The wharf head block, 33 feet wide and 116 feet long at top, will consist of a double row of close faced and stone filled cribs, 133 feet 6 inches long, 10 feet wide and 17 feet clear apart, standing one foot above low level, the outside face of outer crib being sunk in 9 feet 6 inches of water. On each row will rest a superstructure 10½ feet high with icebreaker of granolithic concrete mixed 1, 3, 5. The outer wall will have a width of 6 feet 1½ inch at bottom and 1 foot 9 inches at top, the outside face being inclined 1 in 12 and the inside face 1 in 3. The inner wall will be 5 feet and 1 foot 9 inches wide at bottom and top respectively and have faces inclined 1 in 12 and 1 in 5. The front wall will be reinforced every 10 feet by 1½-inch vertical iron bars with plates inserted in the concrete near the outer face. The top of said wall will be anchored with the bottom of rear wall by four 1½-inch iron bars 32 feet long. A double slip, each 10 feet wide and at elevations of 3½ and 7 feet from low water, will be made in the face. The 3-inch pine flooring will rest on a steel structure composed of 24, 20 and 18-inch I-beams with 8-inch I-connections distanced 3 feet 6 inches.

The approach, 123½ feet long, will be of stone 18 feet wide at top with sides ripped and sloped 1 in 12.

During May and June, 1905, materials were procured and at the end of June, the roadway was about four-fifths completed. The expenditure during the year amounts to \$5,074.76.

## WENDOVER.

Wendover, in the County of Prescott, is situated on the south shore of River Ottawa, about eight miles from Plantagenet, on the Canadian Pacific railway. It contains three stores, two hotels and a telegraph office.

The construction of a wharf at this place was commenced by day labour in September, 1901. The structure consists of the following:—1. A stone embankment of a length of 160 feet from the shore, by a width of 18 feet at top, with sides sloping 1 in 1, and a height of 12 feet. 2. A trestle or pile approach of a length of 342 feet from former to head block, by a width of 18 feet for 294 feet, and a width of 60

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feet for the remaining 48 feet adjacent to the head block. 3. A pilework head block, laid at an angle of 82 degrees and 30 minutes with the approach, and of a length of 71 feet by a width of 32 feet, with a close-faced cribwork icebreaker 37 x 24 feet at its upstream end.

The wharf at its outer face has a height of 30 feet, stands in 10 feet at low water and is 3 feet above high water level. There is a floor, 34 feet long by the width of the wharf adjacent to the icebreaker and 8 feet above water level, with a slip 38 feet long and 11 feet wide, sloping 1 in 5. A storehouse and waiting-room, 20 x 36 feet, is erected on the approach near the eastern side of slip. Two clusters of piles, 30 each and well bolted together, are placed at equal distances between wharf and shore, to protect the approach against the ice.

The wharf, though not completed, was opened to traffic in June, 1902. Expenditure, 1901-02, \$6,502.22.

During the fiscal year 1902-03, the sum of \$3,083.17 was expended in building the pile icebreaker and one of the clusters of piles mentioned above, in bracing the pile approach and in raising the stone embankment.

The wharf was completed at the end of fiscal year 1903-04, the sum of \$1,097.48 being expended. The bracing of the approach was reinforced, the top of the hill leading to the wharf lowered and the stone embankment finished.

In 1904-05, slight damages to the piles by the ice called for repairs amounting to \$119.62.

## PROVINCE OF MANITOBA.

### ARNES WHARF.

The work of constructing a landing pier at Arnes has been proceeded with. The land required as an approach to the wharf was also obtained and surveyed. The wharf as built has answered a good purpose, and was well patronized. It consists of an approach composed of five pile bents, 15 feet centres and 165 feet of an external row of close-piling with intermediate piles within 5 feet centres, braced latterly with 4 x 10 timbers alternating with 1-inch round iron rod and brace piles every 10 feet, strengthened with two outside 6 x 10 waling pieces bolted with long 1-inch round iron screw bolts, extending from one side waling to the other, and the whole filled with stone. As reported when it occurred, an ice crack formed at the end of the pier, and when it suddenly closed, 30 feet of ice piled up on the end of the pier and shook it some, but did no great damage, as it had not been quite completed.

In order to obviate any further difficulty of the kind, it was decided to drive at the outer end a cluster of twenty-five piles, and bolt them together with 1-inch iron screw bolts. The amount expended in labour, stone, timber and iron, aggregated \$5,463.22.

### GIMLI PIER.

An extension of 100 feet has been built to the Gimli wharf, and laid out in the direction of Willow Point, at an angle of 38 degrees, 15 minutes, so as to create the necessary harbour of refuge. The work done consisted in a row of closely driven piles around the outside, with three intermediate piles every 5 feet braced latterly with two brace-piles every 10 feet, with 4 x 10 braces every alternate 10 feet, tied with 1½-inch iron rods extending from outside to outside of the work. The north side and end of this work was sheet-piled with 4-inch tamarack, well spiked on to the inner longitudinals and further solidified by 2½ x 4-inch strap-iron placed on the outside of the sheet-piling, and drift bolted through with 1 x 1½-inch drift-bolts. The south side of the work was completed with one 10 x 12 lower,

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and one 6 x 12 upper walings, bolted on to the inner longitudinal pieces, and further by the rods running through the wharf, and the whole filled in with loose stone.

This work has been greatly appreciated by those interested in navigation, as well as the inhabitants of Gimli. The ground about this pier is stony, particularly on the south side. Some inconvenience has been experienced by steamboat men this spring, on account of the low water, and therefore the appearance of a greater number of boulders than first observed or ever noticed at high water.

One or two steamboats had narrow escapes at this point during storms. The general opinion appears to be that some dredging, at all events the removal of the boulders alluded to, be done about this wharf, particularly within and around the wing, far enough out to enable steamboats to turn.

The expenditure during the last fiscal year amounted to \$5,142.38.

## LAKE FRANCIS OUTLET.

The dredge *Manitoba* and vessels operated during last season at the Lake Francis work. Dredging a channel about 60 feet in width, and 8 feet in depth, casting some of the material south of the cut, also filling behind as well as covering the sheet piling driven on the north side, to prevent the filling in of the dredged channel, around the north-west end and side of the north pier. A quantity of material was also dumped into deep water. When the rough weather did not permit work being done outside, the inside turning basin was increased in length, width and depth. The quantity dredged was 12,540 cubic yards.

Besides the dredging 300 feet of additional sheet piling was constructed at a cost of \$3,735.93, making a total expenditure of \$9,094.38 for the fiscal year just expired.

Generally speaking, the development of this harbour is nearing a successful completion, and is already in a condition to allow the largest steamboats on the lake to come in and out with safety, when properly handled.

A large volume of water flows through this canal, at a rate of velocity varying in extent with the prevailing winds. The only trouble experienced so far in maintaining a regular width and depth of channel, has been, firstly, sedimentary matter lodging at the inner end of the canal just at the entrance to the turning basin; secondly, a bar forming outside the west end of the north pier, but the lengthening of that pier has partly overcome that difficulty, and it is thought that the further north pier extension of 200 feet shall entirely overcome the said difficulty.

## SELKIRK WHARF.

The wharfage facilities were extended at Selkirk by building a pile wharf having a frontage of 252.6, and a rear end measurement of 265 feet; (as a protection against the ice shoves) or an average length of 260.2 feet, built in the same manner as the old wharf, excepting that the upper end has two rows of closely driven piles and sheet piled on the outside with two 8 x 10 waling pieces. The close-piling extends 50 feet 6 inches from the upper end, and from there on to the end, the piles are driven 2 feet 8 inches centres, sheet piled, on the outside with 4-inch tamarack planking, with two 8 x 10 waling pieces continued at the upper end. Life chains were also put around the ends and front of the wharf, the whole for 20 feet in width was filled with stone.

The total cost of the work done during the fiscal year just ended, was \$8,876.44, an average cost per foot frontage is higher than the cost of the previous extension; but this is accounted for by the fact that a separate wharf was built, therefore a greater number of piles were driven in order to resist the pressure of the ice at the upper end. The bracings were also of a more substantial nature, and the labour and material higher than the previous year. The reason why the old structure was not continued, as previously reported, is that the owners of adjacent property strongly objected to it, and in compliance with instructions received from the department it

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was built opposite lots 12 to Dufferin avenue, inclusive. The cost also included some work of dredging done in front of the wharf. The total length of the old wharf aggregates 500 feet, the present addition 260·2 feet, which makes a total length of 720·2 feet frontage of available wharfage at Selkirk, which seems to serve a good purpose, if we may judge by the number of vessels that patronize the wharf, and the extent of freight shipped over it.

## MANITOU RAPIDS, WINNIPEG RIVER.

The work of buoying the channel about Manitou rapids and Winnipeg river, was done, and maintained during the navigation season, but the work of removing obstructions to navigation about Manitou rapids was not proceeded with for want of plant to do the work.

## NORTH-WEST TERRITORIES.

## SASKATCHEWAN RIVER.

From repeated demands from towns on the shore of the Saskatchewan river, the department is about to make a cursory examination of the navigability of the river. The pressing need was more especially demonstrated by the City of Prince Albert. The government has here authorized an expenditure of \$1,500 to defray expenses in removing the boulders and large rocks, which hindered navigation for light draught boats (2 to 4 feet draught) for a distance of 250 miles. Under the superintendence of competent captains the channel of the Saskatchewan was cleaned of boulders and rocks opposite the town site and as far above as two miles, forming a total distance of four and a half miles. This stretch was the only hindrance to ordinary navigation, as far as Battleford a distance of 215 miles. Four trips were made between Edmonton and Prince Albert during the summer months, and these could not have taken place without the above-mentioned improvements. Work was carried out during March, on the ice, and during June, at extremely low water.

The total expenditure during the last fiscal year amounted to \$944.51.

## BRITISH COLUMBIA.

## ANDERSON AND KENNEDY LAKES.

The work on Anderson lake, on Barclay sound, is not what it should be, the timber used in cribwork being in most instances too small. A slide had carried away some 50 feet and formed a bar at bottom of cribwork. This will have to be removed and the cribwork repaired. Otherwise the work has made a great improvement and boats are now able to track up to the lake without difficulty.

The work at Kennedy lake, on Clayoquot sound, is very satisfactory, solid and well built. A little further extension, both up and down stream, will complete this work as far as it is desirable to proceed with it at present, and even now, access to the lake is a simple proposition.

The amount asked for 1905-06, of \$2,500, should carry both works to completion as far as is justified by the present requirements.

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The expenditure has been as follows.—

## Anderson lake—

Wages. . . . .	\$ 912 00
Material. . . . .	100 56
Provisions. . . . .	188 47
Transportation. . . . .	28 50
	<hr/> \$ 1,231 53

## Kennedy lake—

Wages. . . . .	\$ 895 87
Material. . . . .	140 08
Provisions. . . . .	220 50
	<hr/> \$ 1,256 50

Total. . . . .	\$ 2,488 03
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## CHILLIWACK.

This wharf is a somewhat more ambitious structure than either Langley or Mount Lehman to meet the much larger requirements of the locality. Chilliwack is at present the head of navigation on the Fraser river and has daily communication by steamer with New Westminster. The wharf and warehouse were built as a union terminus where both lines of steamers could receive and discharge their freight, which aggregates a considerable amount in the year. The wharf consists of the usual platform and ramp, but in addition there is a large warehouse 50 by 35 feet with a lean-to for teams to unload under shelter and a cattle slip. At the date of writing this structure had been completed under an additional grant of \$1,000, but to the end of the fiscal year the expenditure was kept within the original grant, as follows:—

Wages. . . . .	\$ 581 33
Material. . . . .	1,292 00
Tug hire. . . . .	85 00
Inspection. . . . .	41 30
	<hr/>
Total. . . . .	\$ 1,999 63

## COLUMBIA RIVER, ABOVE GOLDEN.

The work on this service is entirely in the interests of navigation and upon which our new tug boat *Muskrat*, completed in July, 1904, has been steadily engaged during the open season in cutting sweepers along bank; repairing dam at north end of Windermere lake; clearing channel at Salmon beds, between lake and bridge at Athalmer; extending wing dams at various points; and clearing snags from the river near Golden; with the result that navigation is now maintained without difficulty by the different river steamers until the close of navigation, which hitherto was impossible during the season of low water.

The expenditure on this service has been as follows:—

Wages. . . . .	\$ 2,195 43
Provisions. . . . .	427 47
Material. . . . .	1,732 95
Fuel. . . . .	27 00
	<hr/>

Total. . . . .	\$ 4,382 85
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## COLUMBIA RIVER, BELOW GOLDEN.

The work on the Columbia river on this service, that is, between Donald and Beaver Mouth, a distance of 12 miles, is in the interests of the Columbia River Lumber Co., at whose request the appropriations have been granted. It comprises a wing dam, 4 miles above Beaver Mouth, to repair the one partially destroyed by high water in August last, for the purpose of preventing logs hanging upon the west side of the river. It is a heavy crib structure, securely bolted and filled with stone, covered with 3-inch plank, and heavily ripped along face and back, and has successfully withstood the freshet of this year without apparent detriment.

The other work contemplated is some 2 miles below Donald, and consists of a pile fence across head of three channels, which cut across bend in river, to prevent saw logs entering these subsidiary channels and piling up on bar at lower end. The enormous number of logs thus stranded is a serious matter to the mill men and, in their interest, justifies considerable outlay to obviate. This work was interrupted by an unusually rapid rise in the river so that but little has been done further than getting out the piles and timber necessary for the structure, and building a new and larger scow for our pile driver. We are now pushing the work at the best and most favourable stage of water for our purpose.

The expenditure for the past year on this service has been as follows:

Wages. . . . .	\$ 1,830 42
Provisions. . . . .	620 91
Material. . . . .	1,806 14
Team hire. . . . .	326 74

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\$2,584 21

## COLUMBIA RIVER AT REVELSTOKE.

For reasons fully explained in previous reports there was no work done on this service during the season of 1904. The system determined upon for the protection of the river banks at Revelstoke, was such a radical departure from the former methods, that work was delayed until the best possible data had been obtained. A thorough survey was made during the winter of 1904-05; from the data obtained it was decided, instead of attempting further protection by means of mattrassing, to endeavour to so divert the water, by means of a dam across the shallow river channel, and opening, by dredging, a new channel through the bar, as to prevent it impinging on the high friable bank, to the serious detriment of property and buildings in this part of the town of Revelstoke. There is every reason to think that our efforts will prove successful, while realizing fully the uncertainty and more or less experimental nature of river diversion.

There is no use in damming the river until such time as we have made a channel to induce the water to flow in the direction wanted, and to get the full benefit of the cutting force of the current, to lessen the amount of excavation required. The stripping of the surface of the bar was done by ordinary labour. The dredge *Nakusp* commenced the work of making the cut for the proposed diversion on May 20th, and continued, with fairly good success, until June 13th when, unfortunately, a serious accident tied her up for the balance of the fiscal year. The break consisted of the 'A' frame breaking loose at the foot of port leg and going overboard, carrying with it crane, depper, &c. The depper arm was broken, also both legs of 'A' frame, the casting at head of frame lost, and the turntable badly twisted. The cause of the accident was a defective weld in the strap holding leg of frame to deck. The delay in getting to work again was owing to the difficulty of getting timber for dipper arm, and in waiting for castings from Toronto. The work is now progressing as favourably and as expeditiously as the capacity of the dredge will admit. The piles, stone, &c., are all ready for the dam so soon as the time arrives for us to put it in. In the

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meantime the entrance to cut is protected by some 200 feet of pile and crib protection in the lower side of mouth of cut.

The principal expenditure in connection with this work was in wages, for the large force of men engaged in stripping the bar of heavy stones and breaking up the indurated or cemented surface, so that the high water would have the greater effect; breaking down, by quarrying, some 2,000 cubic yards of broken rock, and getting out the piles; and was as follows:

Wages.....	\$ 6,021 56
Provisions.....	283 79
Materials.....	2,079 18
Team hire.....	483 80
Towage.....	100 00
Survey.....	212 00
Fuel.....	87 50
Total.....	<hr/> \$9,267 83

## COLUMBIA RIVER, ABOVE REVELSTOKE.

This work was closed down at the end of November last, the appropriation of \$3,000 for this service having been expended. The length of river covered by our work of improvement extends from the head of Canyon eight miles above Revelstoke to Downie creek, some fifty miles, upon which much valuable work has been done in taking out boulders and blasting reefs at different points such as China bar, One Mile riffle, Seventeen Mile Riffle, Rocky point, and head of Canyon, to the material benefit of navigation and satisfaction of the captain of the *City of Revelstoke*, the only steamer running on this portion of the Columbia river.

I may add that this is about as bad a stretch of water as it is usual to navigate in any craft and is only safe under the most favourable circumstances with a reliable steamer in the hands of a thoroughly competent wheelsman, both of which the Revelstoke Navigation Company possess.

The work will be continued under a further small appropriation, as it is advisable to proceed cautiously, otherwise, in removing one difficulty we are liable to create increased difficulties at another point. The work is in the hands of a most competent and reliable foreman, Mr. J. M. Kellie, who has had charge since its commencement.

The expenditure has been as follows :—

Wages.....	\$ 1,842 41
Provisions.....	466 57
Material.....	690 02
Total.....	<hr/> \$ 2,999 00

## COLUMBIA RIVER, AT ARROWHEAD.

There was no work done at this point until March 1 last. The work consists of a wing dam 750 feet in length and 8 feet above low water level. It runs from left bank of river opposite head of Cottonwood island, diagonally down and across stream at a low angle to current. By contracting the channel it is anticipated the increased velocity will cut away the large and increasing body of silt, deposited during high water, to a sufficient extent to allow the passage of steamers at any stage of the water. The dam consists of two rows of piles driven 6 feet between rows and at 6 feet centres, filled with brush and rock, and faced with a waling of 3 x 10-inch plank, 10 inches apart, from low water mark to top of pile. There is no doubt but that this



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structure will have the desired result, although it may be necessary to extend it to its originally intended length of 1,200 feet.

The expenditure has been :

Wages. . . . .	\$ 2,960 73
Material. . . . .	1,377 51
Team-hire. . . . .	231 00
Tug-hire. . . . .	710 00
Hire of pile-driver. . . . .	127 50
Contingencies. . . . .	35 03
Total. . . . .	<u>\$ 5,441 77</u>

## COLUMBIA RIVER, BETWEEN ARROW LAKES.

After the completion of the work at Beaton, in November, 1904, the dredge *Nakusp* was engaged, during January and part of February, in cutting a channel at Two Beacon bar, giving a good depth across the bar at any stage of water. For the balance of February and all of March the crew were engaged in repairing the old wing dam below Burton, some 200 feet of which was carried out during the summer of 1904. Some dredging was done at the landing at Fire Valley, upon the conclusion of which, and before moving to Revelstoke, the dredge was taken out of the water at Nakusp and thoroughly overhauled. Up to the end of November this dredge had moved some 19,000 cubic yards at Beaton, and subsequently at the Two Beacon bar some 16,000 cubic yards of material, and 1,200 cubic yards of rock was taken out by the crew and used in the extension of the dam at Burton.

The expenditure on this service has been as follows :—

Wages. . . . .	\$ 5,415 43
Provisions. . . . .	2,089 60
Material. . . . .	1,167 26
Fuel. . . . .	526 26
Team-hire. . . . .	189 00
Contingencies. . . . .	97 94
Total. . . . .	<u>\$ 9,485 49</u>

## COQUITLAM RIVER.

This work is in the interests of the lumbermen and consists in keeping the river clear of drift piles, stumps, logs and other obstructions brought down by the high water and left stranded on the different bars ; and in closing the shallow subsidiary channels or sloughs by strong floating booms securely moored to the shore. This work has been pretty thoroughly done and a material improvement effected with a limited expenditure, which has been as follows :—

Wages . . . . .	\$1,554 76
Material. . . . .	819 96
Team hire. . . . .	17 00
Total. . . . .	<u>\$2,391 72</u>

## DUNCAN RIVER.

The usual work in connection with this service consists in cutting the brush and trees, commonly called sweepers, from the banks of the river and removing snags, &c.,

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annually renewed in the river by the erosion of the banks during high water. A further appropriation of \$2,000 has been asked for the next fiscal year, which I think should terminate this annual grant as there should be some finality to this expenditure.

The details of the expenditure are :—

Wages.....	\$1,350 75
Provisions.....	307 35
Material.....	230 22
Boat hire.....	69 00
Total.....	\$1,957 32

## KOOTENAY RIVER.

This expenditure was spent in clearing the Kootenay River of snags from Kootenay landing, Kootenay lake, to Goat River landing, some fifteen miles, more for the benefit of the lumbermen than for navigation. The work was commenced on November 4, 1904, and completed on December 10 last.

The worst of the snags were removed by being shot to a depth of from 8 to 10 feet below surface and a very material improvement to navigation has thus been effected.

The expenditure was as follows :

Wages.....	\$890 00
Provisions.....	269 93
Material.....	196 49
Transportation.....	33 75
Boat hire.....	69 00
Total.....	\$1,459 17

## LADYSMITH.

This wharf was erected as a local convenience, at the request of the town of Ladysmith, as a point of call for the small coasting steamers instead of the large coaling wharfs, which are not convenient nor suited for this class of service. The wharf is complete, with warehouse, and graded approach down a bluff some 40 feet in height. The work was commenced on October 15 and practically completed on December 15. Expenditure during last fiscal year, \$3,976.98.

## LANGLEY.

This wharf, in common with a number of others that have been applied for, is a good substantial structure. It has a platform 40 by 70 feet with a ramp or slip 15 feet wide by 90 feet long extending from lower end on a slope of 1 in 5 to extreme low water, giving facilities for shipment at any stage of the water. This leaves the platform clear and admits of a warehouse 15 by 30 feet placed at one end, without unduly contracting the space. This has been the general plan adopted in these small wharfs. The only difference is in the length of approach from the shore to the main wharf or platform mentioned. In this case there has been serious erosion of the bank above the wharf site, in front of the town of Langley, to stop which an appropriation has been made in the estimates for 1905-06, when this work and some further protection to the wharf will be done.

The expenditure has been as follows :—

Wages.....	\$ 663 25
Provisions.....	214 28
Material.....	1,061 24
Tug hire.....	30 00
Fuel.....	20 00
Total.....	\$ 1,988 77

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## MOUNT LEHMAN.

This is a similar wharf to that described for Langley and was commenced on November 16, and completed on December 16 last, with the exception of a warehouse for which an additional sum has been secured and which will be built during 1905-06.

The expenditure has been as follows :—

Wages.....	\$ 560 76
Provisions.....	96 96
Material.....	1,252 03
Tug hire.....	30 00
Fuel.....	37 10
Total.....	\$ 1,976 85

## NORTH THOMPSON RIVER.

This work consists of a dam across the east channel of river at Jemeson's, or Hefly's rapids and was commenced on December 14, 1904, and completed in the beginning of March, 1905. The object of the dam is practically to act as a coffer dam to dry the bed of the river below, by shutting off the water from the east channel, to admit of the hard reef of cemented gravel and boulders, having a fall of 8 feet in 50 feet, being removed and the fall distributed uniformly over a distance of some 400 feet, after which the dam will be removed. It has been found sufficiently tight to dry the river bed and the reef can be removed after high water. We are of the opinion that the removal of the reef will not only improve navigation at this point but also have the effect of diverting a considerable body of water from the west channel, and to a certain extent lessen the erosion of a gravel bank on the west side of the river.

The original design of driving a row of piles across stream, with a parallel row at 8 feet centres to brace from, was found impracticable as it was impossible to drive the piles to a sufficient depth to make them secure, so we were obliged to reinforce by a bracing of cribwork which has been found sufficient to stand the test of this year's high water, and will no doubt remain effective until the necessary excavation is completed below.

The expenditure has been as follows :—

Wages.....	\$ 3,161 80
Provisions.....	1,150 89
Material.....	964 31
Team hire.....	1,135 02
Total.....	\$ 6,412 02

## SALMON RIVER.

As this work covers a stretch of 40 miles from the mouth of the river upwards, it was deemed advisable to place two conductors in charge. The work consisted in clearing sweepers from banks, making cutoffs in the very sharp bends for the purpose of straightening the channel, clearing out drift piles and snags, and protecting banks from erosion at different points for the purpose of facilitating the driving of saw logs down the river in the interests of the Columbia River Lumber Company, of Golden, which hold extensive timber limits at the head-waters of the river. The object of the expenditure has been attained and the river is now fairly navigable for floating down logs, or the purpose intended. The work was commenced on October 18, 1904, and completed on December 17 following.

No further appropriation other than an emergency one of \$1,000 to cover possible outstanding accounts and some slight further work that may be required, has been

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asked for 1905-06, as the lumbermen should now be able to look after the work and prevent jams forming.

The expenditure for the past year has been as follows:

Wages.. . . .	\$ 3,733 14
Provisions.. . . .	869 35
Material.. . . .	265 50
Team hire.. . . .	106 10
Contingencies.. . . .	20 93
Total.. . . .	\$ 4,995 02

## SYDNEY.

This structure succumbed to the severe storm of continuous south-easterly gales, during October 29 and 30, 1904. The structure was substantially built and pile braced, but the holding ground was bad and the stone filling was inadequate to give it the required stability to withstand the exceptionally heavy test of wind and waves. Nothing short of a sea-wall will stand in this exposed position, the expense it is not felt justified to recommend.

Expenditure during last fiscal year, \$6,252.01.

## SKEENA RIVER.

The works contemplated under this appropriation comprise: The improvement of the navigation of the Skeena river by the removal of obstructions in the shape of large boulders in the channel between Kitsilas canyon and Hazelton—a distance of 80 miles; some work of the same description in the North Skeena pass in the channel taken by the coasting steamers running North to Port Simpson from Port Essington at the mouth of the Skeena; and the removal of snags between the mouth of the river and the head of tide water—or that portion covered by the fishing fleet during the fishing season—in the interests of the fishermen and the various canneries, some 13 in number, engaged in this industry on this river.

As the improvement to the navigation of the river is in a fairly complete state—from the work already done—with the exception of the North Skeena pass, it was thought desirable to confine our attention this year almost exclusively to snagging, clearing the different reaches of the river as effectively as our imperfect appliances would permit. These snags are renewed to a greater or less extent every year by the annual freshet, and, in common with those on the Fraser river, require constant attention during and before the fishing season. The chief loss to the nets occurs in the deeper reaches, or from Aberdeen to the mouth of the North Skeena pass, in which, while able to cope with the shallower reaches, our small snag scow is inadequate to the purpose, and it is here, as stated, that the greatest loss in nets occurs.

In former reports considerable stress was laid on the necessity for a more effective snag boat for this service. A boat somewhat similar to, but smaller than our snag boat *Samson* on the Fraser river, is what is required, at a cost of some \$25,000 if built in New Westminster.

The expenditure on the above service has been :

Wages.. . . .	\$ 2,844 99
Provisions.. . . .	1,261 79
Material.. . . .	777 66
Fuel.. . . .	520 00
Total.. . . .	\$ 5,404 44

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## SPALLUMCHEEN RIVER.

This work consists of an extension 150 feet upstream and 250 feet down stream, of the work of last year. It is a pile protection in front of the property of the Columbia Flouring Mills Company, at Enderby, and is of a substantial nature. The piles are driven at low water mark, tied to bank piles, and faced with 2 x 8-inch planks laid 4 inches apart, partially filled with brush and stone to prevent scour. The balance of the filling is to be made from edgings, &c., and other refuse, bringing it up to the level of the bank and proving an efficient protection from further erosion. The work was commenced on November 10 last and completed by the end of December. An inspection made in February showed that the instructions had been carefully followed, and the work done in a particularly satisfactory manner.

The expenditure was as follows :—

Wages.. . . .	\$ 835 00
Material... . .	819 22
Team-hire.. . . .	273 00
Total.. . . .	<u>\$ 1,927 22</u>

## THETIS AND KUPER ISLAND.

This work was for the purpose of cutting a boat channel through from Claim Bay, on the east, to Telegraph Harbour, on the west of a low-lying sandy neck connecting these two islands. The distance across on our line of cut was some 3,000 feet. The size of channel intended to be made was 30 feet by 5 feet at low tide, but it was found impossible to continue this depth, owing to encountering sand-stone rock and hard-pan for some 500 feet at west end of cut at low water mark, requiring blasting before removal was possible. We succeeded in getting a channel through, although not navigable at low tide. A short wait will enable fishing boats and canoes to pass through without difficulty. We had to charter a dredge for this purpose as our own were engaged on more important works. Operations were commenced on April 1 and completed by the end of the fiscal year, June 30.

The expenditure was as follows :—

Wages.. . . .	\$ 2,235 71
Provisions... . .	625 13
Material... . .	630 16
Dredge-hire.. . . .	1,050 00
Tug-hire... . .	302 50
Fuel... . .	165 25
Water... . .	35 00
Contingencies.. . . .	31 80
Total.. . . .	<u>\$ 5,075 55</u>

## DREDGING OPERATIONS.

During the fiscal year 1904-05, dredging was done at the following places :

## PROVINCE OF NOVA SCOTIA.

Barrington Passage, Shelburne county.  
Cheticamp, Inverness county.  
Liverpool, Queen's county.  
Lockeport, Shelburne county.  
Mabou, Inverness county.  
Pictou, Pictou county.  
Shelburne Harbour, Shelburne county.  
Sydney, Cape Breton county.  
Yarmouth, Yarmouth county.

## PROVINCE OF PRINCE EDWARD ISLAND.

Georgetown, King's county.  
Montague River, King's county.  
Morrell River, King's county.  
Woods Islands, Queen's county.

## PROVINCE OF NEW BRUNSWICK.

Campbellton, Restigouche county.  
Dalhousie, Restigouche county.  
Maguapit and French lake.  
Pointe du Chêne, Westmoreland county.  
Shippegan gully, Gloucester county.  
St. John harbour, St. John county.  
St. John river, Heustis wharf.  
Washademoak river.  
Ackerly wharf.  
Cambridge wharf.  
Robertson wharf.  
Webster wharf.  
Westfield, King's county.

## PROVINCE OF QUEBEC.

Berthier (en bas), Barbotte river, Belœil, Blanche shoals, Beauharnois channel, Batiscan, Calumet, Chateauguay basin, Charlemagne, Chambly, Chicoutimi, Como, Doucet's Landing, Graham, Grenville, Ile du Pas, Isle aux Noix, L'Assomption, Lacolle, Murray Bay, Notre Dame de Pierreville, Ottawa river, Pointe Platon, Pentecost, Quebec, Rivière Ouelle, Rigaud, River Jésus, Rivière du Loup, Roberval, St. Antoine, St. Denis, St. Charles, St. Aimé, St. Jean des Chaillons, St. Michel de Bellechasse, St. Andrews, St. Johns, St. Maurice, Sorel, Three Rivers, Terrebonne, Ville Marie, Yamaska.

## PROVINCE OF ONTARIO.

Bronte, Cumberland, Collingwood, Cobourg, Goderich, Haileybury, Hamilton, Hawkesbury, Kamisnistiquia river, Kincardine, Kimpton, Midland, New Liskeard, Neebing river, Owen Sound, Penetanguishene, Pickering, Point Edward, Port Arthur, Port Bruce, Port Burwell, Port Stanley, Port Hope, Rondeau, Sarnia, Sauguen river, Trent river, Trenton, Waubaushe and Fesserton, Wolfe island, Whitby, Wiarton.

## DREDGING OPERATIONS.

### PROVINCE OF NOVA SCOTIA.

#### DREDGING AT BARRINGTON PASSAGE, SHELBURNE COUNTY.

Barrington Passage, a seaport town of Shelburne county, four miles west of Barrington head, and 165 miles south-west of Halifax. The population is engaged in fishing and farming.

There were no wharfs in this district having a depth of water at their outer ends, capable of floating vessels at low water, and the bottom is of such a nature, that it was not thought desirable to attempt dredging for the purpose. After an examination of the locality, it was decided to improve Sherrow's channel, a mile to the east of Robertson's wharf, and in 1888-89 the dredge 'Canada' was employed to improve the channel, removing 11,745 cubic yards.

In 1889-90, the work was continued by improving the channel from its mouth to where the present public wharf or pier now stands to a depth of 11 feet by dredging a basin to enable vessels to lie afloat at low water, when the further quantity of 8,464 cubic yards was removed.

In 1891-92, the wharf or pier being completed, the dredge 'St. Lawrence' improved the basin to a depth of 13 feet at low water, removing 4,375 cubic yards.

In 1897-98, the dredge 'Canada' removed 12,780 cubic yards further improving the channel; and again in 1898-99 removing 12,510 cubic yards.

In the fiscal year 1903-04, the dredge 'Canada' operated there, removing 19,440 cubic yards of mud, from September 1 to December 15, 1903, at a cost of 44.92 cents per cubic yard.

From July 8 to November 30, 1904, the work was continued by the 'Canada', removing 32,490 cubic yards, at a cost of 24.62 cents per cubic yard.

The total amount of dredging at Sherrows channel is 61,020 cubic yards, cost \$17,612.09.

The 'Canada' worked at Barrington Passage from December 1 to 9, removing 1,890 cubic yards, at a cost of 25.59 cents per cubic yard.

#### DREDGING AT CHETICAMP, INVERNESS COUNTY.

Cheticamp is a port settlement in this county, on the Gulf of St. Lawrence, 58 miles north of Mabou. It has a church, school buildings, several stores, telegraph and express offices, and the district has a population of about 2,500.

The harbour between Cheticamp island and the main land is entered from the north-east through a dredged channel eighty feet wide, having fourteen feet at low water, between the Shingle spit on the north-east extremity of the island and Carven point. There is a depth of 21 feet within the harbour, but the sand bar (before being dredged), had only two feet over it at low water, and the greater part of it dry. There is good anchorage for the largest vessels inside. Numbers of fishing and other vessels run here for a harbour of refuge or shelter in stormy weather.

Keeping the range lights in view, while the channel is but eighty (80) feet wide, a vessel can run in safely. There are several wharfs and a government pier in the harbour, where vessels can land and take in cargo. A steamer carrying mails runs between Pictou and Cheticamp, touching at Arisaig, Port Hood, Mabou and Margaree.



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A large fishing business is done here, and the export of cattle, agricultural produce, fish and oil is very considerable.

The work of the department here was in reducing the bar, and it was commenced in 1875-76 by the old dredge 'Cape Breton,' and continued in several seasons since by the old 'Cape Breton,' 'Canada' and 'Geo. McKenzie'.

From July 1 to 8, 1904, the 'Geo. McKenzie' was employed here removing 1,250 cubic yards of sand and gravel, at a cost of 45.78 cents per cubic yard, and the dredge 'New Cape Breton' from July 1 to 26, 1904, was employed here removing 6,405 cubic yards of sand and gravel, at a cost of 28.46 cents per cubic yard.

The total amount of 206,275 cubic yards have been removed up to the present, costing \$71,409.02.

## DREDGING AT LIVERPOOL.

The town of Liverpool, at the head of Liverpool bay on the south-east coast of Nova Scotia, and the county town of Queen's, has a population of about 2,500. Mill-ton, two miles farther up the river, where the sawmills are, has some 1,200.

In connection they carry on an extensive trade with Halifax, the United States and the West Indies. The exports are principally lumber, fish and farm produce. Ship-building is carried on to a small extent, and the port owns considerable tonnage. Steam planing mills, a foundry, carriage factories, a pulp mill and other industries are located here.

There are several hotels, churches, courthouse, jail, bank and stores, telegraph and express offices, and a very fine city hall, also a marine railway for hauling vessels of medium size.

Liverpool harbour is never frozen over, the bay runs in for a distance of  $2\frac{1}{2}$  miles between Eastern head and Moose point,  $1\frac{1}{4}$  miles distant from each other. Spring tides rise 8 feet, neaps 5 feet. In proceeding up Liverpool bay, the services of a local pilot are necessary.

The dredge 'Canada' operated here from April 14 to 25, removing 1,260 cubic yards of mud from the channel at a cost of 44.61 cents per cubic yard.

The total amount of dredging performed at Liverpool is 82,230 cubic yards, cost \$31,944.10.

## DREDGING AT LOCKEPORT.

The 'Canada' worked here from June 8 to 30, removing 5,040 cubic yards, at a cost of 19.04 cents per cubic yard.

## DREDGING AT MABOU.

Mabou river runs into the Gulf of St. Lawrence in a north westerly direction through the County of Inverness, and about six miles from Port Hood. From the entrance to the bridge, a distance of  $3\frac{1}{2}$  miles, this river resembles a mountain loch, being in one part three quarters of a mile wide. Besides the Mabou, the main branch, two smaller streams enter from the eastward.

The harbour is sometimes dangerous to enter, as the tides frequently flow at the rate of from four to six knots an hour; ordinary springs rise 4 feet; neaps 2 feet,

The entrance was formerly at the southern end of a sand bar, over which was but four feet of water, at low tide. From this bar, for about 400 yards the channel ran E.S.E., then turning north, followed the inner side of the sand hills for about the same distance, turned again sharply southeast for about 1,400 yards when it expended into a fine basin, some  $2\frac{1}{2}$  miles long, and  $\frac{1}{4}$  to  $\frac{1}{2}$  mile wide.

After survey and consideration by the department, it was decided that this long and crooked channel should be closed, and a shorter, straighter one opened through the bar at the northern end.

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In 1871 a contract was made for the purpose of this work, afterwards piers were built for the protection of the channel. The artificial channel requires frequent dredging to keep it clear. It is now being dredged to 16 feet. Extensive dredging has been done here at a large outlay of money.

The place, however, is a finely settled agricultural district. The shores of Mabou present flourishing farms on either side, and the scenery is beautiful. Seams of coal and plaster are found here and worked, the latter exported to considerable extent. Mabou Harbour, Mabou Mouth and Mabou N.E. and S.E. are adjacent settlements on the river, and have a combined population of about 2,500. There is a good export trade and a prosperous fishery. Saw mills, grist mills, stores, hotels, telegraph, telephone and express offices are here. The Hawkesbury and Inverness railway line passes through the village.

During the past fiscal year the dredge 'Cape Breton' operated here from July 27 until November 20, on the river and on the outer bar to a depth of 16 feet removing 67,725 cubic yards stone, gravel, sand and part of the hull of an old vessel at a cost of 10·72 cents per cubic yard.

The whole amount of dredging is 201,477 cubic yards and the expenditure at Mabou to the end of the present fiscal year for dredging, independent of first contract, is \$60,237.

#### DREDGING AT PICTOU.

Pictou harbour is the finest on the southern shore of the Gulf of St. Lawrence, east of Gaspé. The valuable coal mines and stone quarries in the vicinity, and finely settled and fertile country enhance its importance.

On the north shore of the harbour, along the declivity of a ridge, the town of Pictou is situated, opposite which the harbour expands into three large arms, and at the heads of these are East, Middle and West rivers.

Pictou is the eastern terminus of a branch of the Intercolonial Railway and of the Oxford and Pictou branch, and it is 113 miles north-east of Halifax. The town is well built, having many good stores, banks, factories, saw mills, foundry and machine shops, marble works, stone quarries and other industries; also an academy, library, Masonic hall and several fine churches. The town is lighted by gas, has a population of about 3,400 and a very considerable trade. The annual exports of coal are very large. The P.E.I. Steam Navigation Co. makes Pictou a terminus for their steamers, and it is a place of call for other lines of steamers.

The dredging done by the department was at several localities in the rivers and harbour, to better facilitate shipping, &c., improving the approaches to the wharfs and deepening at and around them for berths. Pictou has a marine slip with two cradles, capable of hauling large vessels, with skilled labour for repairs, &c.

The first dredging done was in 1872-73 at the railway wharf and other wharfs by the dredge 'Canada,' since which time to the present the work has been almost continuous in seasons, at some part of the harbour. The most of the places here named where dredging has been done will also be found under their respective headings.

*Places in Pictou harbour where dredging has been done by this department.*

Acadia Coal Company wharf.  
Albion Mines.  
East River.  
Halifax Coal Company wharf.  
Pictou public market wharf.  
Pictou Railway.  
Pictou Landing Railway wharf.  
Pictou Steam Ferry Company, slip.

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Pictou Bar.

Pictou, Hogg, Craig & Co., wharf.

Pictou, Burnham & Morrell, wharf.

Pictou Vail Colliery.

Pictou, Granton channel.

Pictou, New Glasgow channel.

Pictou, Middle River channel.

Pictou, Dwyer's wharf.

Pictou, Dwyer's berth for ss. 'Campania.'

Pictou, Intercolonial Coal Mining Company, East river.

During the past fiscal year the dredge 'St. Lawrence' operated on the Pictou bar, at the harbour entrance, from July 1 until August 2, removing 17,150 cubic yards, sand and gravel at a cost of 10.83 cents per cubic yard, and leaving a depth of 19 feet. The 'St. Lawrence' also operated at the Market wharf from the 3rd to 31st August, removing 14,000 cubic yards of mud, at a cost of 11.41 cents per yard.

The total amount of dredging at Pictou bar, harbour and rivers up to June 30 is 559,416 cubic yards, and the cost \$152,357.38.

## DREDGING AT SHELburne HARBOUR.

The 'Canada' operated here from April 26 to June 7, removing 7,320 cubic yards of rock, gravel, sand and mud, at a cost of 35.59 cents per cubic yard.

## DREDGING AT SYDNEY, CAPE BRETON COUNTY.

Sydney harbour is on the north-east coast of Cape Breton, three miles wide at its mouth, at five miles within the lighthouse, on Flat Point, the navigable channel contracts to the breadth of half a mile between the two bars of sand and shingle, which extend from the shore on either side. Inside these bars the harbour divides into two arms, called the west and south arms. The harbour is easy of access, and is capable of containing any number of large vessels in safety. It is closed by ice between the end of December and the beginning of May.

The town of Sydney stands on the east side of the South Arm, and is the shipping place for several coal mines, has several fine churches, hotels and government buildings, stone quarries and steel works, and is the terminal of the eastern branch of the Intercolonial railway.

North Sydney is on the north side of the West Arm, and is also a point of shipment for large quantities of coal. The anchorage is sheltered by the north bar. North-westerly winds throw a heavy sea upon the bar, and wash the sand into the harbour.

From November 21, 1904, to January 4, 1905, and April 27 to June 4, and June 12 to 16, 1905, the dredge 'Cape Breton' was engaged deepening to 27 feet at the front and sides of the Nova Scotia Steel and Coal Company's coal and ore piers at North Sydney, removing 39,300 cubic yards of mud, stone, sand, silt and old timber at a cost of \$6,495.47 or 16.52 cents per yard, improving the facilities for shipping the output from their works and mines. From the 21st to 24th June (in part), 1905, the dredge 'Cape Breton' was engaged removing a ballast heap from the harbour, in front of marine slip, 2,205 cubic yards at a cost of \$165.65 or 7.57 cents per cubic yard. From June 5 to 10 this dredge was engaged removing a ballast pier in the harbour in front of the old marine slip, 2,625 cubic yards at a cost of \$364.03, or 13.86 cents per cubic yard.

From June 20, 21, 24 and 30, in part the above named dredge was engaged removing 1,365 cubic yards clay, stone and mud from in front Ingraham's wharf, at a cost of \$180.71 or 13.23 cents per cubic yard, and on June 26, in removing 1,155 cubic yards sand, mud and gravel from in front Salter's wharf, at a cost of \$66.85, or 5.96 cents per cubic yard.

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From June 17 to 20, the dredge 'Cape Breton' was engaged removing 1,470 cubic yards, mud and silt from in front Vooght's wharf, at a cost of \$204.52 or 13.91 cents per cubic yard.

## DREDGING AT YARMOUTH.

The seaport town of Yarmouth, is on a small bay, 205 miles south-west of Halifax, 88 miles from Annapolis. The town is of considerable extent being over two miles in length in a continuous direction. Population over 6,000. It contains many fine buildings, and is the chief shipowning place in the province. It has a large trade in fisheries and there are manufactures of iron castings, machinery, woodenware and a large number of fine stores and six hotels. There are boiler and other factories, and a tannery, custom house and post office, 4 banks, printing offices, newspapers, &c. There is a marine railway capable of hauling vessels of 500 to 600 tons in operation since October 1870. There are thirteen places of workshop, one academy, four large schools and private schools. The town is prettily situated upon gently undulating ground, slightly elevated above the tide waters of its harbour.

Yarmouth is the terminus of the Dominion Atlantic railway, connecting with Halifax, and a line of steamers to Boston. The channel leading to the anchorage off the town is narrow and circuitous, but well marked with buoys. The anchorage within Bunker island is safe from all winds. The channel has had the attention of the government with regard to dredging since 1875. Surveys and plans have been carefully made and closely followed by the dredge with few exceptions, when amended instructions were given. There has been great improvement made here in widening and deepening to 16 feet L.W.S.T.

During the past year dredging was performed at the marine slip from July 1 to 7, alternately, removing 630 cubic yards mud, and at the steamboat wharf July 1 to 7, alternately as tide suited, removing 180 cubic yards, at a cost of 40.24 cents per cubic yard.

The whole amount of dredging at Yarmouth is 421,765 cubic yards, at a cost of \$114,960.77.

The rise of tide in Yarmouth harbour is spring 16 feet, neaps 13.

## PROVINCE OF PRINCE EDWARD ISLAND.

## DREDGING AT GEORGETOWN, KING'S COUNTY.

From May 9 to 22, 1905, the dredge 'Prince Edward' worked at the Queen's wharf, at Georgetown, improving the depth of water there by removing 2,205 cubic yards of mud and sand at a cost of 60.26 cents per yard.

## DREDGING AT MONTAGUE RIVER.

From May 23 to June 30, the dredge 'Prince Edward' worked on the Montague river, removing 10,620 cubic yards of mud and old timbers from the channel at the wharfs at a cost of 3.92 cents per yard.

## DREDGING AT MOREL RIVER, KING'S COUNTY.

The dredge 'Prince Edward' operated on the Morel river from July 1 to August 12, 1904, opening a channel through a bar, towards the Prince Edward Island Railway bridge over that river, by removing 14,580 cubic yards of mud and sand at a cost of 21.31 cents per yard.

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## DREDGING AT WOOD ISLAND.

The dredge 'Prince Edward' operated at the Wood islands from August 13 to November 19, 1904, removing 5,625 cubic yards of sand from between the breakwaters at that place, at a cost of \$1.67·17 cents per yard. The months of May, June, July and August are the most favourable months for dredging at this place.

## PROVINCE OF NEW BRUNSWICK.

## DREDGING AT CAMPBELLTON.

1,750 cubic yards were removed at Campbellton wharf at a cost of 35·47 cents per cubic yard from June 8 to 18, when the arrival of shipping prevented further operations there.

The total amount on the Restigouche river is 142,911 yards; cost, \$30,144·67.

## DREDGING AT DALHOUSIE.

Dalhousie, a port of entry and capital of the county at the entrance of the Restigouche river into the Baie des Chaleurs. It is 272 miles north of St. John by Intercolonial railway.

In front of the town is a well sheltered cove formed by Dalhousie island and a smaller island to the west of it. There is good holding ground for ships in nine fathoms of water. The approach to the harbour is either through a direct but narrow channel between middle ground and Dalhousie island, or to the northward and westward of the middle ground, which though over a flat of three fathoms at low water is usually taken, as there is plenty of room. There are fine wharfs and timber ponds for loading the largest ships. A large trade is done in preserved salmon and lobsters, and the export of timber and lumber.

Stores, factories, hotels, saw mills, several churches and the usual public buildings found in a prosperous town are here with a population of about 800.

The department ordered dredging at Dalhousie and Restigouche river in 1888-89-90, when the 'St. Lawrence' removed 22,301 cubic yards at a cost of \$6,543·08, and at the Traverse, 110,810 at a cost of \$21,415·93. The work was first on the Traverse, between Dalhousie and Campbellton, removing trees and sunken timber, with the view if possible to get 15 feet channel through a fine sand bottom. Then a winter berth was dredged between the wharfs at Dalhousie to enable the mail steamer to continue her trips late in the fall, winter and repair at Dalhousie, and resume her trips on the first opening of navigation, as owing to there being no winter berth, the steamer had to close her trips early, to enable it to reach winter quarters safely, and the ice prevented her early arrival from Quebec in the spring.

Spring tides rise 9 feet; neaps, 6 feet.

During the present year the work was continued on the Traverse from May 26 to June 7 and June 19 to 30, removing 8,050 cubic yards at a cost of 19·43 cents per cubic yard.

## DREDGING AT MAQUAPIT AND FRENCH LAKE.

From October 6 to November 11, this dredge operated at Maquapit and French lake, tributaries of Grand lake, removing 12,915 cubic yards mud and sand at a cost of 15·48 cents per cubic yard, in part opening a channel there.

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## DREDGING AT POINT DUCHÊNE.

As stated in my report of last year, Point Duchêne is situated on Northumberland strait and is the north-east terminus of the Shediac branch of the Intercolonial railway, two miles from Shediac. It has long piers for shipping, and range lights on Shediac island (at the entrance) and on the pierhead.

The Prince Edward Island Steam Navigation Company steamers run every day between this port and Summerside, Prince Edward island, while navigation is open, and connect with trains. It contains several stores, two or three hotels, telegraph and express offices, &c., and a population of about 250. Here is Shediac harbour the easiest of access and egress on this part of the coast. It is superior to Buctouche and Cocagne in the depth over the bar, and more extensive than the latter. The space for mooring shipping with 12 to 17 feet low water, being three-quarters of a mile in length and from two to three cables wide, is a secure harbour. The country about Shediac is fertile and well settled.

The improvement of the channel from Chene Spit to and along the piers by dredging has occupied the attention of the department for several years. In 1874-75, the 'Canada' worked here also in 1882-83 and 1883-84, and in 1890-91, the dredge 'St. Lawrence,' giving a total amount excavated to that date of 69,700 cubic yards at a cost of \$21,125.92. A depth of 15 feet at low water spring tides was made.

Spring tides rise 4 feet; neaps, 2 feet.

The dredge 'Cape Breton' was engaged here from November 1 to 30, 1902, and May 11 to June 30, 1903, in completing a 15-foot channel, one hundred feet wide at low water, from the line of the range lights on Shediac island, to the outer end of the public wharf, and a basin in front of the wharf to 19 feet, 360 feet in length, 140 feet wide, removing 40,110 cubic yards at a cost of \$4,915.80 or 12.25 cents per yard and was still prosecuting the work at the close of the fiscal year 1902-03.

From July 1 to 17, 1903, the dredge 'Cape Breton' continued the work to its completion, removing 8,295 cubic yards of sand and mud, at a cost of 20.55 cents per cubic yard.

The dredge 'St. Lawrence' operated at Point du Crêne, Shediac harbour, September 1 to December 6, 1904, and April 26 to May 25, 1905, improving the depth of basin, the berth at the railway wharf for ss. 'Northumberland,' and the channel out to the buoy; removing 41,650 cubic yards at a cost of 14.10 cents per cubic yard.

The whole amount of dredging at Point du Chêne is 182,980 cubic yards, cost \$42,162.18.

## DREDGING AT SHIPPEGAN GULLEY, GLOUCESTER COUNTY.

Shippegan Gulley, a passage between Shippegan island and the mainland, is situated on the western side of the Gulf of St. Lawrence, and is distant three miles south east of Shippegan village, the terminus of the Caraquet railway, and sixty-five miles east of Bathurst, the shire town.

From July 9 to October 30, 1904, and May 8 to June 30, 1905, the dredge 'George McKenzie' has operated on the Shippegan Gulley, removing 26,090 cubic yards in straightening the channel at a cost of 38.61 cents per cubic yard, and continuing the work at the close of the fiscal year.

## DREDGING AT ST. JOHN.

The City of St. John, the commercial metropolis of the province is most advantageously and picturesquely situated on the estuary of the magnificent River St. John, one of the most notable in America, where it flows into the Bay of Fundy. One of the extraordinary features of this river is, what may be called its reversing fall. This flowing through a channel at the mouth of the river about 400 yards long and restricted to but 80 yards in width, presents an imposing view, and the rare



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sight of a fall which reverses daily. This is occasioned by the great rise and fall of tide in the estuary. While at low tide the level of the river is some 15 feet above the sea, the 27 feet rise of water brings the harbour water some 12 feet above the level of the river, thus making two falls during every tide, one outward and one inward. Two bridges cross the river at this point, one a suspension bridge for ordinary travel, the other a railway bridge on the cantilever principle.

The dredging done in the harbour of this city by the Dominion government in sundry places is as follows :—The earliest at Anchor Line wharf, at the railway wharf, York Point and at the ferry slips. Previous to the construction of the cantilever bridge across the river the connection between the Intercolonial railway and the Canadian Pacific railway was by ferry, and for the benefit of the railways the department has had the slips and approaches dredged.

During the present season the dredge 'New Dominion' operated at the winter port berths in dredging for new piers from July 1 to September 5, and October 9 to December 14 and December 18 to 31, 1904, January 1 to 9, and April 7 to June 30, 1905, removing 58,835 cubic yards of mud, sand, timber and boulders at a cost of 19·37 cents per cubic yard. It also operated at Patridge island from September 6 to October 8 and December 15 and 16, improving the entrance to the piers at the island where landing is made by immigrants from the shipping, who go to the hospitals there, by removing 4,475 cubic yards of stone, gravel and sand at a cost of 49·77 cents per cubic yard. The dredge 'New Brunswick' also operated from November 19 to December 31, 1904, January 1 to February 3, and April 10 to June 30, 1905, removing 20,130 cubic yards of mud, timbers, wharf, slabs and edgings in part preparing for foundation of new piers at a cost of 43·49 cents per cubic yard.

The total amount removed for winter port berths and harbour channel has been 401,926 cubic yards at a cost of \$78,467.40.

## DREDGING AT HEUSTIS WHARF, ST. JOHN RIVER.

From August 17 to 23, the dredge operated in front of the Heustis wharf, St. John river, improving the depth of water by removing 270 cubic yards of mud at a cost of 78·77 cents per cubic yard.

## DREDGING AT ACKERLY WHARF, WASHADEMOAK.

From July 23 to August 16, the dredge 'New Brunswick' operated in front the Ackerly wharf, Washademoak, improving the depth of water there by removing 4,840 cubic yards mud, at a cost of 20·56 cents per cubic yard.

## DREDGING AT CAMBRIDGE WHARF, WASHADEMOAK.

From July 1 to 22, this dredge operated in front the Cambridge wharf, Washademoak, improving the depth of water by removing 2,900 cubic yards mud, at a cost of 37·01 cents per cubic yard.

## DREDGING AT ROBERTSON'S WHARF, WASHADEMOAK.

From September 21 to October 3, this dredge operated at Robertson's wharf, Washademoak, improving the depth of water by removing 5,750 cubic yards mud, at a cost of 7·34 cents per cubic yard.

## DREDGING AT WEBSTER WHARF, WASHADEMOAK.

From August 24 to September 20, and October 4 and 5, the dredge 'New Brunswick' operated in front of the Webster wharf, Washademoak, improving the depth



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of water by removing 5,900 cubic yards of mud, at a cost of 15·29 cents per cubic yard.

#### DREDGING AT WESTFIELD.

From November 12 to 19, the dredge operated in front of the wharf at Westfield, St. John river, improving the depth of water there by removing 1,300 yards of mud at a cost of 27·86 cents per cubic yard.

### MARITIME PROVINCE DREDGES.

#### *The Dredge 'St. Lawrence.'*

July 1, 1904-05, the 'St. Lawrence' was engaged on the bar at the entrance to Pictou harbour, dredging to 19 feet low water, and continued the work until August 2, when it operated from August 3 to 31, improving the channel into the Market wharf at Pictou town. On September 1 under orders it proceeded to Point du Chêne, in Westmorland county, and operated there until December 6, 1904, deepening the water at the Intercolonial Railway wharf, at the ss. 'Northumberland' berth, and forming a turning berth for the steamer. It also improved the depth of water in the basin and the channel out to the range ligths. At the latter date it went into winter quarters at Point du Chêne. During the winter necessary repairs and renewals were made to the hull, engines, and dredging machinery. New tumblers were furnished by the I. Matheson & Co., Ltd., and by St. John Iron Works, and new cylinder for steam steering engine. Other work by Mr. Connors, Shediac, and Mr. Armstrong, of Moncton. On receipt of orders the crew was shipped and work continued to completion at Point du Chêne from April 26 to May 25, 1905. Under orders this dredge then proceeded to Campbellton, Restigouche county, and from May 26 to June 27 and June 19 to 30, operated on the 'Traverse,' between Dalhousie and Campbellton, June 8 to 18 operating in front of the government wharf at Campbellton.

#### *The Dredge 'Canada.'*

From May 1 to July 7, operated alternately at the marine slip and wharfs of the Yarmouth and Boston Steam Ships at Yarmouth, improving the depth of water at these places. At the latter date under orders the 'Canada' proceeded to Sherrow's channel, Shelburne county, N.S., where it operated from July 8 to November 30, improving the channel to 12 feet. From the latter date to December 19, it operated at Barrington Passage, Shelburne, and then went into winter quarters at Liverpool, where new air, circulating, feed and bilge pumps were put in and other necessary repairs and renewals made, and the dredge placed on marine slip, hull scraped and painted, and crew shipped, and from April 14 to 25 it operated in Liverpool harbour, improving the channel near the marine slip. Under orders it then proceeded to and operated from April 26 to June 7, under much difficulty, in Shelburne harbour, removing rocks, mud and gravel, improving the depth of water in front of the wharfs there. Further work required will necessitate the use of a spoon dredge. The dredge was then removed to Lockeport, where it operated from June 8 to the close of the fiscal year.

#### *The Dredge 'New Dominion.'*

At the first of July, 1904, this dredge was continuing the dredging at winter port berths, St. John harbour, which it did until September 5, and from September 6

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to October 8 it operated at Patridge island at the harbour entrance. October 9 to December 14 it continued the winter port work, and December 15 and 16 it again worked at Patridge island, then resuming the winter port work on December 18. It continued the same until January 9, when it laid off for repairs. Under orders the work at winter port was resumed April 7, and was being continued at the close of the fiscal year.

*The Dredge 'Prince Edward.'*

July 1, 1904, the dredge 'Prince Edward' was at Morell, King's county, P.E.I., continuing the work of opening a channel through a bar in the Morell river, which it completed by August 13, when it left for Wood islands, Queen's county, P.E.I., and after arrival there operated, deepening the water between the breakwaters, to November 19, at which time the weather became unfit for work, and dangerous for the dredge to remain.

Under orders the dredge and plant was removed to Charlottetown, and from there it was ordered to Georgetown, where it arrived on December 1, and immediately began unloading spare gear and making dredge ready for work, when snow and rain set in, the ice making it unfit for work, and the dredge was ordered into winter quarters, the scows and water boat being hauled out on W. W. Jenkin's wharf. During the winter the dredge and plant was under repairs, and ready for work by May 9, when the ice had left. From May 9 to 22, it operated at the Queen's wharf at Georgetown, and May 23 to June 30 on the Montague river in several places.

*The Dredge 'George McKenzie.'*

. This dredge from the first of July continued the work at Cheticamp, Inverness county, Cape Breton, to July 8, and then proceeded to Shippegan in Gloucester county, New Brunswick, where it operated opening a new channel through a long point at the entrance to the harbour until October 20, when the dredge was placed in winter quarters at the new pier at Lameque.

Necessary repairs were made during the winter and early spring. Operations were again resumed May 8, and being prosecuted at the close of the fiscal year.

Owing to the long tow to deposit spoil, and to keep the dredge supplied with lighters, a second tug was engaged, the tug 'St. Nicholas,' owned by the J. B. Snowball Company, Limited.

*The Dredge 'Cape Breton.'*

This dredge operated at Cheticamp, Inverness county, Nova Scotia, from July 1 to 26, 1904, improving the depth of water in the channel at that place. At the last mentioned date orders were given and the dredge and plant removed to Mabou harbour, where it operated from July 27 to November 20, dredging the outer bar to 16 feet L.W.S.T., when wind and weather permitted work, and when unable to work on bar, improving the channel in the harbour to same depth; the work on bar was completed for about half the distance. At the latter date orders were given and the dredge and plant removed to North Sydney, at the Nova Scotia Steel and Coal Company piers, where it operated November 21 to January 4, 1905, and went into winter quarters there.

During the winter the two dredge buckets were rebuilt and repaired, the engines taken down and put in working order, also necessary repairs made to boiler, dredging machinery, hull and barges.

Orders were given, crew shipped and work resumed at the company's docks on April 27, and continued to June 4; June 5 to 10, engaged removing a ballast pier in the harbour and June 12 to June 16 it completed the company's docks. From June

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17 to 20, improved the dock at Vooght's wharf, and June 21 to 30, improved Ingraham's dock and removed a ballast heap, also improved dock at Salter's wharf.

*The Dredge 'New Brunswick.'*

At the beginning of the fiscal year 1904-05, this dredge was operating at Cambridge wharf, Washademoak, Queen's county, New Brunswick, and completed same by July 22. From July 23 to August 16, it operated at Ackerly wharf and completed same. August 17 to 23, it operated at Heustis wharf completing the work there, August 24 to September 4 and October 5, operated at Webster's wharf to completion. September 24 to October 3, operated at Robertson's wharf, completing the dredging there. October 6 to 11, it operated at Maquapit and French lakes, tributaries of Grand lake in Queen's county, New Brunswick. Ice making, the dredge and plant were removed to and completed the work at Westfield wharf, St. John river, from November 12 to 18. November 19, the dredge was removed to and operated on the dredging for winter port piers, St. John harbour, from November 19, 1904, to February 3, 1905, when it was laid up and repairs made, work was again resumed on April 10, and continued to June 30.

*The Tug 'Cricket.'*

This tug, owned by the department, attended and served the dredge 'New Brunswick' while working on the St. John river, Washademoak, and Maquapit and French lakes. It has not been in commission from November 19, 1904, to June 30, 1905, a more powerful tug being required to take barges from winter port work to sea. It requires a new hull.

*The Tug 'Rona.'*

This tug, owned by the department, attended the dredge 'George McKenzie' July 1 to 8, at Cheticamp, Inverness county, Nova Scotia, then at Shippegan July 9 to October 20, when it returned to St. John and attended the dredge 'New Brunswick' from November 19 to February 3, 1905, when it had necessary repairs made, while the dredge was under repairs, and resumed work with the dredge, continuing the same until April 24, when it was, under orders, sent to Shippegan, Gloucester county, where it attended the dredge 'George McKenzie' to the end of the fiscal year.

Memorandum of quantities removed by the several dredges in the maritime provinces during the fiscal year 1904-05 :

	Cubic yards.
'St. Lawrence' . . . . .	82,600
'Canada' . . . . .	48,810
'New Dominion' . . . . .	63,310
'Prince Edward' . . . . .	33,030
'Geo. McKenzie' . . . . .	27,340
'Cape Breton' . . . . .	122,250
'New Brunswick' . . . . .	53,105
	<hr/>
	430,445
	<hr/>

## SESSIONAL PAPER No. 19

## DREDGE VESSELS REPAIRS AND WINTERING, ETC.

*Maritime Provinces.*

The following amounts were expended on repairs and renewals to dredges and plant, during the year 1904-05:—

'St. Lawrence' .. . . .	\$ 2,001 78
'Canada' .. . . .	5,468 78
'New Dominion' .. . . .	2,037 72
'Prince Edward' .. . . .	4,796 85
'Geo. McKenzie' .. . . .	831 12
'New Brunswick' .. . . .	1,981 14
'Cape Breton' .. . . .	2,054 80
Tug 'Cricket' .. . . .	Nil
Tug 'Rona' .. . . .	1,102 44
•	
Total .. . . .	\$ 20,274 63

## DREDGING PLANT.

The following is a summary description of the dredging plant owned and operated by the Public Works Department in the maritime provinces:—

*The self-propelling Elevator Dredge 'St. Lawrence' (iron hull).*

Length over all—175 feet.

Beam—30 feet.

Draught when loaded aft—13·5 feet.

Draught when loaded forward—8·5 feet.

Least working depth (ladder with 32 buckets dropped 30 feet from bow)—8·5 feet.

Greatest working depth (bucket ladder dropped 40 feet from bow)—28·0 feet.

Capacity of hopper for spoil material—350 cubic yards.

Speed when light—6 to 7 miles per hour.

Speed when loaded—3 to 4 miles per hour.

Daily rate of dredging—

Hard material—350 to 700 cubic yards.

Ordinary earth—750 to 1,000 cubic yards.

Soft material—1,050 to 1,400 cubic yards.

*The self-propelling Elevator Dredge 'Canada' (iron hull).*

Length over all—130 feet.

Beam—20 feet.

Draught when loaded aft—11·5 feet.

Draught when loaded forward—7·0 feet.

Least working depth—7·0 feet.

Greatest working depth (ladder 24 buckets)—16·0 feet.

Capacity of hopper for spoil material—90 cubic yards.

Speed when light and newly painted—6 to 7 miles per hour.

Speed when loaded—3 to 4 miles per hour.

Daily rate of dredging—

In hard bottom—180 to 270 cubic yards.

With ordinary digging—180 to 360 cubic yards.

In soft material—360 to 450 cubic yards.

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*The Spoon Dredge 'New Dominion' (wooden hull).*

Length over all—90 feet.

Width—28 feet.

Draught—5½ feet.

Greatest working depth—21 feet.

Daily rate of dredging—

In hard material—300 cubic yards.

In ordinary material—450 cubic yards.

In soft material—600 to 700 cubic yards.

Number of dump scows or barges used—4 (two are condemned).

*The Spoon Dredge 'Prince Edward' (wooden hull).*

Length over all—80 feet.

Width—28 feet.

Draught—6 feet.

Greatest working depth—21 feet.

Daily rate of dredging—

Hard material—300 cubic yards.

With ordinary material—500 cubic yards.

In soft material—600 to 700 cubic yards.

Number of dump scows or barges used—3.

*The Spoon or Dipper Dredge 'George McKenzie' (wooden hull).*

Length—90 feet.

Width—28 feet.

Draught—6 feet.

Greatest working depth—22 feet.

Daily rate of dredging—

In hard material—350 cubic yards.

Ordinary material—500 cubic yards.

In soft material—600 cubic yards.

Number of dump scows or barges used—3.

*The Boom and Dipper 'Cape Breton' (steel hull).*

Length—91 feet.

Beam—36 feet.

Draught—7½ feet.

Greatest working depth—34 feet.

Daily rate of dredging—

In hard material—1,000 cubic yards.

Ordinary material—1,500 cubic yards.

Soft material—2,000 cubic yards.

Number of barges used (each of 210 cubic yards capacity, steel)—2.

*The Clam Shell Dredge 'New Brunswick' (wooden hull).*

Length over all—90 feet.

Width—25 feet.

Draught—2½ feet.

Greatest working depth—17 feet.

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Daily rate of dredging—

In hard material—180 cubic yards.

Ordinary material—300 cubic yards.

Soft material—650 cubic yards.

Number of deck scows used—3.

One pile driver, engine and boiler fitted on scow.

One stone lifter, engine and large grips (no boiler).

*Tug 'Cricket.'*

Length—36.5 feet.

Beam—7.3 feet.

Draft—3.10 feet.

Horse power—4.

*The 'Rona.'*

Length—85 feet.

Beam—19.3 feet.

Draft—8 feet.

Horse power—25.

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CLASSIFICATION of Disbursements of the Dredges in the Maritime Provinces during the Year ending June 30, 1905.  
DREDGE 'ST. LAWRENCE.'

ITEMS.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Total.
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	
Wages.....	483	33	483	33	492	16	476	89	483	33	491	54	356	41	269	33	276	52	453	13	553	96	660	00	5,479 93
Coal.....	137	50	244	50	136	50	557	25	557	25	557	25	107	27	.....	.....	.....	.....	.....	.....	878	50	878	50	1,974 25
Provisions.....	.....	.....	318	56	199	05	121	82	146	86	108	45	167	27	.....	.....	.....	.....	.....	.....	101	74	389	92	1,553 67
Stores.....	.....	.....	13	31	.....	.....	.....	.....	7	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	172 65
Equipment.....	.....	.....	.....	.....	193	68	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	310 85
Water.....	.....	.....	.....	.....	16	13	1	50	8	00	7	50	6	00	.....	.....	33	00	.....	.....	23	00	5	00	68 33
Repairs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	719 53
Pilotage.....	78	00	81	00	85	49	78	00	78	00	347	56	.....	.....	333	97	.....	.....	.....	.....	.....	.....	.....	.....	400 49
Wharfage.....	.....	.....	34	00	6	00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900 49
Contingencies.....	60	00	5	35	18	82	12	50	3	19	7	10	1	50	1	93	.....	.....	.....	.....	47	63	12	61	182 77
Totals.....	778	83	1,180	05	1,147	83	690	71	726	53	1,524	29	531	18	605	23	309	52	469	77	741	58	2,197	15	10,902 67
Working expenses.....	778	83	1,180	05	1,147	83	690	71	726	53	1,524	29	531	18	605	23	.....	.....	.....	.....	.....	.....	.....	.....	9,225 68
Repairs, ordinary.....	Nil.	.....	Nil.	.....	Nil.	.....	Nil.	.....	Nil.	.....	1,176	73	121	50	Nil.	.....	Nil.	.....	.....	.....	Nil.	.....	5	00	5 00
" extraordinary.....	Nil.	.....	Nil.	.....	Nil.	.....	Nil.	.....	Nil.	.....	347	56	409	68	Nil.	.....	309	52	.....	.....	Nil.	.....	Nil.	.....	1,671 99
Totals.....	778	83	1,180	05	1,147	83	690	71	726	53	1,524	29	531	18	605	23	309	52	469	77	741	58	2,197	15	10,902 67



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## DREDGE 'CANADA.'

Wages.....	428 01	430 07	430 00	430 00	429 05	377 17	222 00	225 95	232 00	307 19	422 26	438 36	4,448 26
Coal.....	253 96	833 35	.....	.....	404 84	.....	.....	.....	36 60	259 65	.....	715 17	2,484 15
Provisions.....	72 90	29 20	159 09	93 09	108 21	61 46	.....	.....	.....	90 61	6 70	108 66	790 92
Stores.....	16 14	.....	.....	11 83	2 55	25 84	31 62	.....	0 13	12 72	91 08	36 32	258 83
Equipment.....	36 85	124 00	10 00	.....	.....	.....	.....	.....	3 49	.....	3 00	86 43	263 77
Water.....	.....	12 30	22 50	45 30	21 00	5 40	.....	.....	5 00	2 00	.....	17 45	130 45
Repairs.....	66 70	10 65	17 37	.....	8 72	28 47	109 14	14 00	1,969 50	688 04	141 60	56 12	3,150 49
Pilotage.....	48 00	54 00	52 00	52 00	52 00	16 00	.....	.....	10 00	.....	68 20	39 00	381 20
Towage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10 00
Wharfage.....	16 18	.....	12 76	.....	10 55	11 56	9 29	.....	15 19	5 00	.....	10 50	15 50
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17 12	27 52	17 12	139 47
Totals.....	919 74	1,494 75	703 72	634 40	1,037 52	525 90	372 05	239 95	2,302 00	1,442 33	761 05	1,610 13	12,043 54
Working expenses.....	853 04	1,484 10	686 35	634 40	1,028 80	497 43	40 91	Nil	54 32	754 29	613 36	1,544 01	8,197 01
Repairs, ordinary.....	66 70	10 65	17 37	Nil	8 72	Nil	Nil	239 95	107 99	194 30	141 69	19 69	567 11
" extraordinary	Nil	Nil	Nil	Nil	Nil	28 47	331 14	.....	2,189 60	493 74	Nil	46 43	3,279 42
Totals.....	919 74	1,494 75	703 72	634 40	1,037 52	525 90	372 05	239 95	2,302 00	1,442 33	761 05	1,610 13	12,043 54

## DREDGE 'NEW DOMINION.'

Wages.....	439 63	379 18	644 62	364 04	374 17	411 07	372 40	317 48	130 77	362 38	435 75	492 47	4,723 96
Coal.....	69 10	174 94	162 00	21 25	.....	74 57	.....	65 77	.....	.....	224 28	146 32	938 23
Provisions.....	62 62	33 09	112 53	48 05	61 49	228 22	39 17	.....	.....	16 40	129 24	224 12	955 43
Stores.....	.....	.....	34 89	14 94	5 69	13 15	10 60	.....	.....	.....	46 55	64 18	190 00
Equipment.....	.....	46 88	.....	111 50	.....	.....	.....	.....	7 00	.....	.....	7 00	214 38
Water.....	.....	135 88	34 00	45 50	42 38	43 63	8 38	.....	.....	.....	112 50	19 25	441 52
Repairs.....	27 20	31 03	273 64	15 15	27 63	171 75	5 75	110 41	4 71	.....	14 63	98 37	775 27
Towage.....	715 00	845 50	671 00	656 75	346 50	424 50	30 00	6 00	.....	166 50	604 00	157 00	4,622 75
Contingencies.....	1 49	.....	1 34	0 70	2 81	2 00	.....	1 43	.....	.....	9 15	0 90	19 82
Totals.....	1,315 04	1,695 50	1,934 02	1,277 88	861 17	1,368 89	466 30	501 09	135 48	545 28	1,576 10	1,204 61	12,881 36
Working expenses.....	1,287 84	1,664 47	1,431 38	1,262 73	823 28	1,103 89	427 55	71 77	Nil	545 28	1,561 47	1,111 24	11,350 90
Repairs, ordinary.....	27 20	31 03	140 29	15 15	Nil	31 62	5 75	Nil	Nil	Nil	14 63	48 37	359 04
" extraordinary	Nil	Nil	362 35	Nil	37 89	173 38	33 00	429 32	135 48	Nil	Nil	Nil	1,171 42
Totals.....	1,315 04	1,695 50	1,934 02	1,277 88	861 17	1,368 89	466 30	501 09	135 48	545 28	1,576 10	1,204 61	12,881 36

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CLASSIFICATION OF Disbursements of the Dredges in the Maritime Provinces during the Year ending June 30, 1905.  
DREDGE 'PRINCE EDWARD.'

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Total.	
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.		
Wages.....	408	97	332	05	426	07	407	19	403	56	475	48	255	18	223	56	490	00	261	16	428	84	1,011	25	5,183	13
Coal.....	59	33	168	44			10	00	50	41	50	70											283	89	622	77
Provisions.....	9	95	87	28	190	95	71	47	94	44	214	45	77	51									175	11	921	17
Stores.....			4	40			26	10	38	70	87	80											18	70	184	45
Equipment.....							267	19	3	20	414	80													685	19
Water.....	57	30	30	00	19	30	85	00					17	50											50	85
Repairs.....									34	00	16	00	26	02	205	71									288	29
Pilotage.....									750	00	325	00													55	00
Forage.....	550	00	650	00	1,947	50	625	00	11	00							350	00			630	00	810	00	6,637	50
Warfare.....																								11	00	
Contingencies.....	4	90	23	15	2	80	9	90		1	93		68	21									187	04	297	93
Totals.....	1,090	45	1,355	32	2,586	63	1,501	85	1,387	24	1,584	23	444	42	429	27	840	00	1,066	91	1,069	59	2,830	13	16,186	04
Working expenses.....	1,090	45	1,355	32	2,586	63	1,501	85	1,387	24	1,584	23	142	32	Nil.		350	00	261	16	1,069	59	1,457	84	13,286	63
Repairs, ordinary.....	Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		146	35	146	35
" extraordinary.....	Nil.		Nil.		Nil.		Nil.		Nil.		Nil.		302	10	429	27	400	00	805	75	Nil.		725	95	2,753	06
Totals.....	1,090	45	1,355	32	2,586	63	1,501	85	1,387	24	1,584	23	444	42	429	27	840	00	1,066	91	1,069	59	2,830	13	16,186	04

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## DREDGE 'GEO. MCKENZIE'.

Wages.....	423 65	433 60	421 09	386 50	149 58	167 50	165 00	160 00	267 56	379 65	444 00	3,575 03
Coal.....	481 60	60 74	545 87	64 00	24 88	.....	9 11	21 27	.....	1 44	563 06	1,714 53
Provisions.....	89 90	.....	10 20	242 99	24 88	.....	1 00	.....	.....	16 85	243 33	687 46
Stores.....	.....	.....	49 86	24 52	.....	.....	.....	.....	.....	.....	92 99	135 36
Equipment.....	.....	16 35	.....	78 20	.....	.....	.....	.....	.....	.....	83 71	228 12
Water.....	0 50	33 50	.....	335 00	.....	.....	.....	.....	.....	33 00	97 00	519 00
Repairs.....	1 85	16 38	.....	76 27	6 05	19 78	4 88	.....	.....	11 60	.....	136 81
Pilotage.....	5 00	3 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 00
Towage.....	.....	.....	.....	500 00	.....	.....	.....	.....	.....	.....	367 50	867 50
Contingencies.....	12 92	1 64	2 55	8 83	15 37	.....	2 93	.....	.....	19 53	6 42	70 19
Totals.....	1,015 42	607 61	1,032 57	1,746 31	195 88	187 28	182 92	181 27	267 56	462 07	1,898 61	7,945 00
Working expenses.....	1,013 57	591 23	1,032 57	1,670 04	180 83	Nil	Nil	Nil	267 56	450 47	1,898 61	7,113 88
Repairs, ordinary.....	1 85	16 38	Nil	76 27	6 05	187 28	182 92	181 27	Nil	11 60	Nil	29 83
" extraordinary.....	Nil	Nil	Nil	.....	.....	.....	.....	.....	Nil	Nil	Nil	801 29
Totals.....	1,015 42	607 61	1,032 57	1,746 31	195 88	187 28	182 92	181 27	267 56	462 07	1,898 61	7,945 00

## DREDGE 'CAPE BRETON'.

Wages.....	434 66	431 85	434 66	435 00	428 23	435 00	411 97	180 00	368 93	470 00	470 00	4,816 55
Coal.....	223 25	.....	109 35	72 08	108 01	.....	126 00	.....	.....	.....	171 00	899 69
Provisions.....	138 29	8 05	43 65	214 84	187 22	103 84	.....	103 85	.....	.....	430 42	1,280 16
Stores.....	37 70	.....	23 25	.....	39 87	.....	.....	.....	.....	.....	11 79	112 61
Equipment.....	.....	.....	.....	.....	.....	103 53	.....	.....	.....	15 00	9 00	127 53
Water.....	32 42	.....	7 50	22 32	73 53	46 68	.....	186 50	.....	.....	30 00	69 92
Repairs.....	.....	.....	20 00	.....	.....	.....	.....	.....	38 75	.....	178 38	546 16
Pilotage.....	510 00	885 00	1,390 00	630 00	1,410 00	810 00	210 00	.....	.....	.....	1,626 00	20 00
Towage.....	.....	.....	30 00	.....	.....	.....	.....	.....	.....	.....	.....	7,671 00
Wharfage.....	15 26	11 55	.....	6 18	.....	22 80	.....	8 40	.....	.....	30 00	30 00
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12 92	14 02	91 13
Totals.....	1,391 58	1,336 45	2,398 41	1,380 42	2,246 86	1,521 85	747 97	478 75	407 68	497 92	2,940 61	15,664 75
Working expenses.....	1,391 58	1,336 45	2,398 41	1,358 10	2,173 33	1,475 17	747 97	112 25	368 93	497 92	2,762 23	14,622 34
Repairs, ordinary.....	Nil	Nil	Nil	22 32	Nil	Nil	Nil	Nil	Nil	Nil	64 38	86 70
" extraordinary.....	Nil	Nil	Nil	Nil	73 53	46 68	Nil	366 50	Nil	Nil	114 00	955 71
Totals.....	1,391 58	1,336 45	2,398 41	1,380 42	2,246 86	1,521 85	747 97	478 75	407 68	497 92	2,940 61	15,664 75

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CLASSIFICATION of Disbursements of the Dredges of the Maritime Provinces during the Year ended June 30, 1905.  
DREDGE 'NEW BRUNSWICK.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	409 26	328 98	324 39	330 00	361 47	406 51	321 92	253 23	384 50	281 28	330 71	462 59	4,194 84
Coal.....		166 50		145 42	66 00	61 38	67 28				263 26		769 84
Provisions ..	65 61	54 66	281 23	89 85	114 24	91 65	103 47	44 97		11 51	83 60	229 67	1,170 46
Stores.....	83 71	24 47	8 50		76 95	38 02	22 46				59 80	37 62	351 53
Equipment ..	34 48				129 85							78 30	242 63
Water.....				1 50	11 00	36 75	29 50				107 25	60 75	246 75
Repairs.....	22 49	23 36	22 21	193 55	33 14	29 58		40 66		134 50	66 85	404 98	971 32
Towage.....	457 50			4 50	868 93	117 00		4 50			647 50	823 00	2,992 93
Contingencies.....		0 50	24 33	2 25	2 25	0 80					6 98	0 58	37 69
Totals.....	1,073 05	598 47	660 66	767 07	1,663 83	781 69	544 63	343 36	384 50	427 29	1,565 95	2,097 49	10,907 99
Working expenses.....	1,050 56	575 11	638 45	573 52	1,605 19	666 35	544 63	264 20	Nil.	292 79	1,499 10	1,692 51	9,402 41
Repairs, ordinary ..	22 49	23 36	22 21	Nil.	Nil.	2 68	Nil.	Nil.	Nil.	Nil.	66 85	130 60	268 19
" extraordinary ..	Nil.	Nil.	Nil.	193 55	58 64	112 66	Nil.	79 16	384 50	134 50	Nil.	279 38	1,237 39
Totals.....	1,073 05	598 47	660 66	767 07	1,663 83	781 69	544 63	343 36	384 50	427 29	1,565 95	2,097 49	10,907 99

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## TUG 'CRICKET'.

Wages.....	141 58	85 00	85 00	85 00	106 95							503 53
Provisions.....	30 00											30 00
Stores.....	29 27			2 85								32 12
Repairs.....		185 37			7 90							193 27
Totals.....	200 85	270 37	87 85	85 00	114 85	Nil	Nil	Nil	Nil	Nil	Nil	758 92
Working expenses.....	200 85	85 00	87 85	85 00	87 85							546 55
Repairs, ordinary.....	Nil	185 37	Nil	Nil	Nil							185 37
" extraordinary.....	Nil	Nil	Nil	Nil	27 00							27 00
Totals.....	200 85	270 37	87 85	85 00	114 85	Nil	Nil	Nil	Nil	Nil	Nil	Nil

## TUG 'RONA'.

Wages.....	190 00	202 50	189 65	190 00	190 00	190 00	190 00	223 50	205 00	192 50	190 00	2,343 16
Coal.....	44 05			86 63	61 99	54 75	31 11	180 48				469 01
Provisions.....	32 50	13 51	3 60	113 52	95 88	23 89	18 49	8 15		42 82	42 82	541 02
Stores.....		4 35	5 83			14 09				12 75	116 61	153 63
Equipment.....	38 48		45 65		22 68						41 70	147 91
Water.....	8 50				21 45							65 59
Repairs.....	22 36		28 16		210 26			38 57		8 53	150 70	509 75
Towage.....		4 00										4 00
Contingencies.....	0 77									10 00	2 04	15 31
Totals.....	336 66	224 36	272 90	303 52	626 30	300 71	324 27	249 22	205 00	576 87	543 87	4,259 38
Working expenses.....	314 30	224 36	244 74	303 52	416 04	300 71	49 60	210 65	Nil	568 34	383 17	3,391 13
Repairs, ordinary.....	22 36	Nil	28 16	Nil	Nil	Nil	Nil	Nil	Nil	8 53	150 70	209 75
" extraordinary.....	Nil	Nil	Nil	Nil	210 26	Nil	274 67	38 57	205 00		Nil	738 50
Totals.....	336 66	224 36	272 90	303 52	626 30	300 71	324 27	249 22	205 00	576 87	543 87	4,259 38

5-6 EDWARD VII., A. 1906

CLASSIFICATION AND QUANTITIES OF MATERIAL REMOVED BY DREDGES IN THE MARITIME PROVINCES DURING THE YEAR ENDING JUNE 30, 1905.  
DREDGE 'ST. LAWRENCE.'

Description of Material Dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Gravel and sand	15,050		6,300	3,150									15,050
Mud and shells	700	1,400											9,450
Sand, ordinary												8,050	10,150
Timber, sand and rubbish		14,000	4,900	10,850	4,900	350				2,450	8,750	1,750	1,750
Mud													46,200
Totals	15,750	15,400	11,200	14,000	4,900	350	Nil	Nil	Nil	2,450	8,750	9,800	82,000

  

DREDGE 'CANADA.'													
Sand												4,140	4,140
Rock and mud												585	90
Gravel and mud											1,125	810	1,335
Clay, mud and stone										1,170	4,050		5,220
Clay and rock		2,610	3,870							660			660
Sand and mud		4,450										900	7,380
Sand and clay			2,790	7,560	5,220	1,890							4,950
Mud	6,300												23,850
Totals	6,300	7,560	6,660	7,560	5,220	1,890	Nil	Nil	Nil	1,920	5,760	5,940	48,810

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## DREDGE "NEW DOMINION."

Hard-pan.....	2,600	1,000	500	.....	.....	.....	.....	.....	3,600
Boulders and gravel..	.....	875	500	.....	.....	.....	.....	.....	1,800
Gravel and clay.....	.....	1,375	.....	.....	425	.....	75	.....	1,450
Mud clay and bould- ers.....	.....	375	5,475	.....	.....	.....	.....	.....	22,410
Clay, stone and mud..	.....	.....	.....	4,000	1,725	300	.....	8,760	6,450
Removing old wharf..	4,950	.....	.....	725	.....	100	5,625	.....	3,300
Mud and edgings.....	2,300	.....	.....	.....	.....	.....	.....	3,300	4,950
Mud.....	.....	.....	1,050	350	3,550	.....	.....	.....	13,550
Totals.....	9,850	3,625	7,025	5,075	5,700	490	Nil	8,760	63,310

## DREDGE "PRINCE EDWARD."

Rock and mud.....	.....	.....	.....	.....	.....	.....	.....	.....	1,170
Rock and clay.....	5,220	.....	.....	.....	.....	.....	.....	1,170	5,625
Sand, shell and rock..	.....	855	.....	.....	.....	.....	.....	.....	3,645
Mud, shells and clay..	.....	.....	.....	.....	.....	.....	.....	2,790	4,860
Clay.....	2,610	.....	.....	.....	.....	.....	.....	.....	2,610
Clay and sand.....	.....	.....	360	.....	.....	.....	.....	.....	360
Sand, ordinary.....	.....	1,598	2,227	495	.....	.....	.....	.....	4,410
Mud and shells.....	.....	.....	.....	.....	.....	.....	.....	.....	945
Mud.....	.....	.....	.....	.....	.....	.....	.....	8,400	9,405
Totals.....	10,080	2,453	2,587	495	Nil	Nil	Nil	3,960	33,030

## DREDGE "GEORGE MCKENZIE."

Gravel and sand.....	.....	.....	.....	.....	.....	.....	.....	.....	440
Clay.....	440	2,340	3,240	.....	.....	.....	.....	.....	5,580
Mud, clay and sand..	.....	.....	.....	.....	.....	.....	.....	7,560	7,560
Sand, ordinary.....	1,610	.....	.....	.....	.....	.....	.....	.....	2,285
Sand and mud.....	.....	.....	.....	.....	.....	.....	.....	.....	2,115
Mud and clay.....	.....	3,510	.....	.....	.....	.....	.....	5,175	9,560
Totals.....	1,610	5,850	3,240	Nil	Nil	Nil	Nil	5,175	27,340



5-6 EDWARD VII., A. 1906

CLASSIFICATION AND QUANTITIES OF MATERIAL REMOVED BY DREDGES IN THE MARITIME PROVINCES, &c.—(Continued.)  
DREDGE 'CAPE BRETON.'

Description of Material Dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Coal, rock, mud and logs.													13,020
Rock.						4,650				2,100	10,920		4,050
Mud and rock.							105					2,835	2,940
Gravel and sand.	5,565	5,250	840	2,100		2,100						1,155	17,010
Ledge, clay, sand and gravel.			1,890								5,565	9,630	17,115
Clay, stone and logs.			3,780			3,780					1,050		8,610
Sand, ordinary.	840	12,180	11,760	19,530	6,510								50,820
Sand and logs.					2,265								2,265
Ledge, mud, sand and stone.		1,680								1,050	3,150		5,880
Totals.	6,405	19,110	18,270	21,630	8,715	10,530	105	Nil.	Nil.	3,150	20,685	13,650	122,250

DREDGE 'NEW BRUNSWICK.'

Edgings, slabs and mud.					400	2,720	1,360	400		1,750	6,250	7,250	20,130
Mud and stone.		1,750											1,750
Sand and clay.		1,250	800										2,050
Gravel and clay.	900				1,300								2,200
Clay.	500			5,625									6,125
Clay and stone.			250										250
Clay, sand and rock.			1,900										1,900
Sand and stone.		270											270
Mud.	4,550	650	5,050	4,495	3,645								18,390
Totals.	5,950	3,960	8,000	10,120	5,345	2,720	1,360	400	Nil.	1,750	6,250	7,250	53,105

## SESSIONAL PAPER No. 19

## DETAILS OF DREDGING IN THE MARITIME PROVINCES.

For the Fiscal Year ending June 30, 1905.

Dredge.	Locality.	Date.	Time Dredging.	Quantity. C. yds.	Expendi- ture at Locality.		Per Cubic Yard for Local Expendi- ture.	Wintering, Repairs, Equipment, and Sundry, <i>pro rata</i> .		Total Cost.	Per Cubic Yard for Total Expendi- ture.	
					\$	cts.		%	cts.		%	cts.
St. Lawrence.	Pictou Bay, Pictou Co., N.S.	July 1 to Aug. 2, 1904.	93 40	17,150	1,160	25	0 06 75	715 07	1,875 32	0 10 93		
	Market Wharf, "	Aug. 3 to 31, 1904.	77 15	14,000	988 76		0 07 06	609 37	1,598 13	0 11 41		
	Point du Clene, Westmorland Co., N.B.	Sept. 1 to Dec. 6, 1904 and Apl. 26 to May 25, 1905.	198 20	41,650	3,634 67		0 08 72	2,240 04	5,874 71	0 14 10		
	Traverse, Restigouche Co., N.B.	May 26 to June 7 and June 19 to 30, 1905.	40 15	8,050	968 08		0 12 02	596 02	1,564 70	0 19 43		
	Government Wharf, Campbellton, N.B.	June 8 to 18, 1905.	20 15	1,750	384 19		0 21 95	236 77	620 96	0 35 47		
Canada.	Steamboat Wharf, Yarmouth, Yarmouth Co., N.S., alternately.	July 1 to 7, 1904.	3 20	180	41 30		0 22 94	31 14	72 44	0 40 24		
	Marine ship, Yarmouth, Yarmouth Co., N.S.	July 1 to 7, 1904.	9 55	630	144 56		0 22 94	108 98	253 54	0 40 24		
	Sharrow's Channel, Shelburne Co., N.S.	July 8 to Nov. 30, 1904.	362 25	32,400	4,450 49		0 13 69	3,354 73	7,805 22	0 24 02		
	Barrington Passage, Liverpool, Queen's Co., N.S.	Dec. 1 to 9, 1904.	18 26	1,800	275 81		0 14 59	207 91	483 72	0 25 59		
	Shelburne, Shelburne Co., N.S.	April 14 to 25, 1905.	22 08	1,260	320 51		0 25 41	241 61	562 12	0 44 61		
New Dominion.	Lockport, "	April 26 to June 7, 1905.	97 21	7,320	1,485 15		0 20 28	1,119 51	2,604 66	0 35 59		
	Winter Berths, St. John, St. John Co., N.B.	June 8 to 30, 1905.	64 56	3,040	547 17		0 10 85	412 46	959 63	0 19 04		
	"	July 1 to Sept. 5 and Oct. 9 to Dec. 14 and Dec. 18 to 31, 1904 and Jan. 1 to 9 and Apl. 7 to June 30, 1905.	1,086 15	58,835	8,444 55		0 14 35	2,955 54	11,400 09	0 19 37		
	Partridge Island, "	Sept. 6 to Oct. 8 and Dec. 15 and 16, 1904.	103 30	4,475	1,650 07		0 36 87	377 52	2,227 59	0 49 77		
	Morell, King's Co., P. E. I.	July 1 to Aug. 12, 1904.	257 36	14,580	1,812 27		0 12 43	1,295 32	3,107 59	0 21 31		
Prince Edward.	Wood Island, Queen's Co., P. E. I.	Aug. 13 to Nov. 19, 1904.	233 05	5,625	5,483 88		0 97 49	3,919 37	9,403 45	1 67 17		
	Queen's Wharf, Georgetown, King's Co., P. E. I.	May 9 to 22, 1905.	95 06	2,205	774 93		0 35 14	553 87	1,328 80	0 60 26		
	Montague River, King's Co., P. E. I.	May 23 to June 30, 1905.	229 30	10,620	1,915 14		0 18 05	1,368 84	3,283 98	0 30 92		
	Cheticamp, Inverness Co., N.S.	July 1 to 8, 1904.	26 00	1,250	375 48		0 30 03	196 80	572 37	0 45 78		
	Shippegan, Gloucester Co., N.B.	July 9 to Oct. 20, 1904 and May 8 to June 30, 1905.	591 25	25,000	6,009 64		0 25 33	3,465 83	10,075 47	0 38 61		
Geo. McKenzie.												

5-6 EDWARD VII., A. 1905

## DETAILS OF DREDGING IN THE MARITIME PROVINCES.

For the Fiscal Year ending June 30, 1905.

Dredge.	Locality.	Date.	Time Dredging.	Quantity.	Expendi- ture at Locality.		Per Cubic Yard for Local Expendi- ture.		Wearing, Repairs, and Super- incidence, <i>pro rata</i> .	Total Cost.		Per Cubic Yard for Total Expendi- ture.	
					C. yds.	\$ cts.	\$	cts.		\$ cts.	\$	\$	cts.
Cape Breton	Cheticamp, Inverness Co., N. S.	July 1 to 26, 1904.	35 45	6,405	1,465	76	0	22-90	356 51	1,823 27	0	28-46	0
	Malou	July 27 to Nov. 29, 1904	335 30	67,725	5,818	33	0	08-63	1,421 49	7,239 82	0	10-72	0
	N. S. Steel and Coal Co., Cape Breton	Nov. 21 to Jan. 4 and April 27 to June 4 and June 12 to 16, 1905.	312 00	35,300	5,225	39	0	13-29	1,270 08	6,495 47	0	16-52	0
	Ballast Pier, Cape Breton Co., N. S.	June 5 to 10, 1905.	20 00	2,625	292	85	0	11-15	71 18	364 03	0	13-86	0
New Brunswick.	Voght's Wharf	June 17 to 20, 1905.	16 15	1,470	164	53	0	11-19	39 99	204 52	0	13-91	0
	Ingraham Wharf	June 20, 21, 24 and 30, 1905.	16 15	1,365	145	38	0	10-65	35 33	180 71	0	13-23	0
	Ballast Heaps	June 21 to 24, 1905.	18 45	2,205	133	96	0	06-04	32 39	165 65	0	07-51	0
	Salter's Wharf	June 26, 1905.	7 00	1,155	53	38	0	04-79	13 47	68 85	0	05-96	0
	Cambridge, Washadenook, Queen's	July 1 to 22, 1904.	90 00	2,900	764	00	0	26-34	309 31	1,073 31	0	37-01	0
	Co., N. B.												
	Ackerly Wharf	July 23 to Aug. 16, 1904.	190 00	4,840	708	41	0	14-63	286 79	995 20	0	20-56	0
	Huestis Wharf	Aug. 17 to 23, 1904.	51 00	270	151	42	0	56-07	61 30	212 72	0	78-77	0
	Webster's Wharf	Aug. 20 to Sept. 20 and Oct. 4 and 5, 1904.	210 30	5,000	544	54	0	10-88	220 31	764 58	0	15-29	0
	Robertson's Wharf	Sept. 21 to Oct. 3, 1904.	85 30	5,750	300	50	0	05-22	121 64	422 14	0	07-34	0
N. B.	Maquait and French Lake, N. B.	Oct. 6 to Nov. 11, 1904.	224 30	12,915	1,423	16	0	11-02	576 15	1,999 31	0	15-48	0
	Westfield, King's Co., N. B.	Nov. 12 to 18, 1904.	40 00	1,300	257	81	0	19-83	104 38	362 19	0	27-86	0
	Winter Berths, St. John, St. John Co., N. B.	Nov. 19 to Dec. 31 and Jan. 1 to Feb. 3 and Apr. 10 to June 30, 1905.	594 00	20,130	6,232	68	0	30-96	2,523 24	8,755 92	0	43-49	0
			5,877 43	430,445	65,181	00	0	15-14	31,651 18	96,832 18	0	22-49	0

## SESSIONAL PAPER No. 19

EXPENDITURE for Dredging in Nova Scotia for the thirty-three years ended June 30, 1905.

[illegible]

5-6 EDWARD VII., A. 1906

EXPENDITURE for dredging in Nova Scotia for the thirty-three years ended June 30, 1905—*Concluded.*

TOTAL FOR THE THIRTY-TWO YEARS ENDED JUNE 30, 1904.				FOR THE YEAR 1904-1905.				Total quantity.	Total Cost.	Cost for each County.
County.	Locality.	Quantity.	Cost.	Cost for County.	Quantity.	Cost.	Cost for County.			
		Cubic yards.	%	cts.	Cubic yards.	%	cts.	Cubic yards.	%	cts.
Halifax	St. Mary's River	81,812		22,352 01				81,812		22,352 01
	Tickle Passage, Little Canisio	3,015		4,477 97				3,015		4,477 97
	Bar, Sonora, St. Mary's River	3,628		2,204 33	57,295 31			3,628		2,204 33
	Chezzetcook	3,920		2,593 71				3,920		2,593 71
	Halifax Ferry	6,177		2,063 38				6,177		2,063 38
	Herring Cove.	26,101		12,049 68				26,101		12,049 68
	Ketch Harbour	4,227		1,690 53				4,227		1,690 53
	Richmond Wharf	792		182 53				792		182 53
	Rachel's Wharf	1,750		620 28				1,750		620 28
	Halifax Railway terminus	35,565		11,056 79				35,565		11,056 79
	Jeddore	21,515		4,958 56				21,515		4,958 56
Inverness	North West Arm	7,350		2,970 39				7,350		2,970 39
	Conrad's Wharf.	1,400		530 04				1,400		530 04
	Salmon River	14,288		5,962 93				14,288		5,962 93
	Spry Bay.	10,665		3,075 72				10,665		3,075 72
	Eastern Passage	2,070		596 97				2,070		596 97
	Sambro	4,815		1,388 61	49,740 12			4,815		1,388 61
	Whycomanagh	19,760		3,491 31				19,760		3,491 31
	Campbell's Pond	4,940		872 83				4,940		872 83
	Port Hastings	270		190 37				270		190 37
	Cheticamp	198,620		63,013 38		7,655	2,395 64	206,275		71,409 02
	Malen	133,752		52,947 18		67,725	7,269 82	201,477		60,237 00
Lunenburg	Port Hood	10,123		5,696 99				10,123		5,696 99
	Grand Etang	10,980		3,431 25	135,663 31			21,980		3,431 25
	Lunenburg	70,510		22,194 57				70,510		22,194 57
	Malone Bay	21,844		5,398 65				21,844		5,398 65
Pictou	Vogler's Cove.	11,610		5,075 53	33,228 75			11,610		5,075 53
	Acadia Coal Co., wharf	22,460		5,262 26				22,460		5,262 26
	Albion Mines.	9,475		2,181 25				9,475		2,181 25
	East River	144,407		47,696 43				144,407		47,696 43
Pictou	Halifax Coal Co., wharf	1,650		359 90				1,650		359 90
	Pictou, Public Market, wharf	99,290		25,416 65		14,000	1,598 13	113,290		27,014 78
	" Railway	64,649		16,337 69				64,649		16,337 69
	" Landing Ry.	48,645		8,808 40				48,645		8,808 40

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	720	246 18	17,150	1,875 32	17,150	720	246 18
" Steam Ferry Co. Slip.	23,550	2,277 93				42,700	4,163 25
" Bar	6,000	1,204 20				1,204 20	29
" Hogg, Craig & Co. whf.	1,050	211 19				1,050	211 19
" Burnham & Morrell	1,305	682 15				1,305	682 15
Vale Colliery	83,173	22,243 98				22,243 98	85,173
River John	25,110	10,707 59				25,110	10,707 59
Granton	35,445	11,735 79				35,445	11,735 79
New Glasgow	15,060	4,984 40				15,060	4,984 40
Middle River	5,400	1,087 66				5,400	1,087 66
C. Dwyer's wharf	5,850	2,000 22				5,850	2,000 22
" berths for SS. 'Campania'	360	123 09				360	123 09
Dwyer & Co.'s wharf							
Intercolonial Coal Mining Co.,							
East River, Pictou	46,900	7,410 86	171,127 91	3,473 45		46,900	7,410 86
Liverpool	80,970	31,381 98	1,290	562 12		82,239	31,944 10
Port Mouton	10,620	2,283 77				10,620	2,283 77
D'Escousse	23,630	10,052 76				23,630	10,052 76
St. Peter's Canal	90,830	27,435 85				90,830	23,435 95
St. Peter's	7,150	2,407 41				7,150	2,407 41
Grand Goulet	23,584	5,570 49				23,584	5,570 49
River Bourgeois	18,920	4,468 87				18,920	4,468 87
Marine Slip	320	56 53				320	56 53
Pontenet	10,080	2,556 14				10,080	2,556 14
Fouchu Harbour	16,875	9,454 94				16,875	9,454 94
Lockeport	75,358	18,026 86	5,040	959 63		80,308	18,986 49
Barrington Passage	40,780	13,123 31	1,890	483 72		42,670	13,607 03
Osborne	900	145 31				900	145 31
Wood's Harbour	1,170	245 45				1,170	245 45
Barrington Public Wharf,							
Sharrow's Channel	28,530	9,806 87	32,490	7,805 22		61,020	17,612 09
Shelburne			41,347 80	11,853 23		7,320	2,604 66
Yarmouth	421,102	114,135 33	810	325 98		421,102	114,135 33
Milton	663	499 46					499 46
Winter	5,450	1,627 60				5,450	1,627 60
Aspey Bay	3,820	1,569 95				3,820	1,569 95
Victoria							
Dredge 'C. B.							
losses.							
Totals	2,939,281	914,445 18	203,400	33,359 47		3,142,741	947,804 65

5-6 EDWARD VII., A. 1906

EXPENDITURE for dredging in New Brunswick for the thirty-three years ended June 30, 1904.

County.	Locality.	FOR THE THIRTY-TWO YEARS ENDED JUNE 30, 1904.				FOR THE YEAR 1904-5.				Total Quantity.	Total Cost. \$ cts.	Cost for each County. \$ cts.
		Quantity.	Cost. \$ cts.	Cost for County.	Quantity. Cubic yards.	Cost. \$ cts.	Cost for County.					
Gloucester.	Bathurst.	98,637	29,095 79					98,637		29,095 79		
	Caranquet.	16,485	6,312 23					16,485		6,312 23		
	Shippagan.	172,778	53,544 01	35,408 02	26,090	10,075 47	10,075 47	26,090		53,544 01	45,483 49	
	Richibucto.	27,180	9,601 45					27,180		9,601 45		
Kent.	Cocagne.	13,065	4,934 24					13,065		4,934 24		
	Buctonche.	3,510	1,110 70					3,510		1,110 70		
	" Priests Point.	4,140	1,310 07					4,140		1,310 07		
	" Chapel Point.	45	14 23	70,514 70				45		14 23	70,514 70	
King's.	Belleville Point.	79,905	13,052 23					79,905		13,052 23		
	Kennebecasis River.	116,270	29,081 83					116,270		29,081 83		
	Moss Glen.	10,200	1,924 47					10,200		1,924 47		
	Westfield.	208,892	53,058 36	35,058 53	1,300	362 19	362 19	208,892		53,058 36	35,420 72	
Northumberland	Horse Shoe, Miramichi.	29,935	7,965 31					29,935		7,965 31		
	Outer Bar.	37,975	10,121 67					37,975		10,121 67		
	Grand Dune.	22,425	4,403 95					22,425		4,403 95		
	Gordon Flats.	6,300	6,969 76	84,519 65				6,300		6,969 76	84,519 65	
Queen's.	Neguac.	292,317	28,086 10		12,915	1,999 31		292,317		28,086 10		
	Grand Lake.	20,440	4,522 82					20,440		4,522 82		
	" McNair's Cove.	87,230	17,190 06					87,230		17,190 06		
	Jenseg.	63,675	8,073 65					63,675		8,073 65		
"	Washadenook.				2,900	1,073 31		2,900		1,073 31		
	Cambridge whif.				4,840	965 20		4,840		965 20		
	" Ackerley wharf.				270	212 72		270		212 72		
	" Huestis "				5,000	764 58		5,000		764 58		
"	" Websters "				5,750	422 14		5,750		422 14		
	" Robertsons "											
	Grimross, mid ground.	12,040	3,274 99					12,040		3,274 99		
	Gagetown Creek Canal.	45,935	7,739 97					45,935		7,739 97		
"	Spoon Island.	3,000	402 51					3,000		402 51		
	Wards Shoal, Salmon River.	46,625	4,593 59					46,625		4,593 59		
	Cutley Shoal.	36,625	3,369 16					36,625		3,369 16		
	Chipman and Briggs Corner.	104,275	12,269 49					104,275		12,269 49		
"	Upper Gagetown wharf.	1,700	1,104 90					1,700		1,104 90		



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Restigouche	McClure Shoals.....	39,525	4,556 66	96,518 96	8,650	1,564 70	5,407 26	39,525	4,556 66	101,986 22
	Queen's Coal Co., Newcastle.....	14,475	1,335 06					14,475	1,335 06	
	Dalhousie.....	22,301	6,543 08					22,301	6,543 08	
	Traverse.....	110,810	21,415 93					118,840	22,680 63	
	Campbell Govt., wharf.....			27,959 01		629 96		1,750	20,926 86	30,144 67
St. John	I. C. Ry. terminus.....	210,492	51,885 40					210,492	51,885 40	
	Navv Island.....	25,294	9,296 79					25,294	9,296 79	
	Marble Cove.....	29,925	4,374 40					29,925	4,374 40	
	Murray's Mills.....	27,555	3,681 41					27,555	3,681 41	
	Indian town wharf.....		132 83					1,615	192 83	
	Long wharf.....	7,137	2,680 24					7,137	2,680 24	
	Miller and Woodman.....	9,275	1,090 42					9,275	1,090 42	
	Hayford and Stetson.....	8,015	942 29					8,015	942 29	
	International wharf.....	450	52 90					450	52 90	
	Adams wharf.....	7,513	3,247 29					7,513	3,247 29	
	Anchor Line wharf.....	4,695	996 81					4,695	996 81	
	Dominion Atlantic wharf.....	15,525	4,484 72					15,525	4,484 72	
	St. John, Winter Berths.....	320,548	53,247 47					398,513	73,403 48	
	" Harbour Channel.....	3,413	5,003 92					3,413	5,063 92	
	Purves and Wharf.....	675	192 57					675	142 57	
	McAvity's wharf.....	4,110	606 88					4,110	606 88	
	Lawtons wharf.....	570	101 46					570	101 46	
	Thorne wharf.....	1,980	249 02					1,980	249 02	
	Maritime Nail Co. wharf.....	1,425	224 52					1,425	224 52	
	Cushing's Mill.....	20,850	1,222 86					20,850	1,222 86	
	Hillyard Bros.....	1,400	314 10					1,400	314 10	
	Kennebecasis River.....	2,025	604 37					2,025	604 37	
Sumbury	Partridge Island.....			144,702 67		2,227 59	22,383 60	4,475	2,227 59	107,086 27
	Oronoto.....	395,417	66,427 58					395,417	66,427 58	
	McLean wharf.....	625	181 59					625	181 59	
	Ox Island.....	51,800	5,266 50					51,800	5,266 50	
	French Lake.....	23,475	3,787 49					23,475	3,787 49	
	Bents wharf, Margerville.....	2,310	428 44					2,310	428 44	
Westmorland	Upper Sheffield.....	3,830	425 15					3,830	425 15	
	Point du Cloué.....	141,330	36,287 47			41,650	5,874 71	182,980	42,162 18	76,516 75
	Cape Tormentine.....	35,120	9,004 92					35,120	9,004 92	51,167 10
York	Fredericton.....	126,365	21,679 06					126,365	21,679 06	
	St. Marys Ferry.....	15,570	6,827 36					15,570	6,827 36	
	Gibson.....	30,395	4,379 52					30,395	4,379 52	
	Naashwaak.....	1,600	435 22					1,600	435 22	
	Fisher and Chestnut Shoals.....	8,200	1,547 12					8,200	1,547 12	
	Canada Eastern Ry. wharf.....	3,970	1,013 98					3,970	1,013 98	
	Springhill, Chapel and Russell Bars.....									
	Robinson's Bar.....	96,295	24,386 78					96,295	24,386 78	
	Douglas Booms.....	6,965	1,717 16					6,965	1,717 16	
	New Brunswick, Equipment.....	14,235	1,512 87					14,235	1,512 87	
			1,591 12						1,591 12	
	Total.....	3,376,744	681,580 27	681,580 27	193,955	46,348 89	46,348 89	3,570,699	727,929 16	727,929 16

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## EXPENDITURE for dredging in Prince Edward Island for the thirty-three years ended June 30, 1905.

County.	Locality.	TOTALS FOR THE THIRTY-TWO YEARS ENDED JUNE 30, 1904.				FOR THE YEAR 1904-05.				Total Quantity.	Total Cost.	Costs for each County
		Quantity.	Cost.	Cost for County.	Quantity.	Cost.	Cost for County.					
								Cubic yards.	\$		cts.	\$
King's.	Grand River.	76,170	15,304 04						76,170	15,304 04		
	Montague River.	171,675	33,263 49						182,295	36,547 47		
	Murray Harbour, South	101,253	18,147 03		10,020	3,283 98			101,253	18,147 03		
	Sturgeon.	16,026	6,066 27						16,026	6,066 27		
	St. Mary's Wharf.	21,963	4,752 55						21,963	4,752 55		
	Georgetown Ry. Wharf.	1,002	408 32						1,002	408 32		
	" Queen's Wharf.				2,295	1,328 80			2,295	1,328 80		
	Cardigan Bridge	35,955	8,619 36						35,955	8,619 36		
	Newport.	3,240	917 82						3,240	917 82		
	Souris	3,825	1,083 53						3,825	1,083 53		
Queen's.	Murray River	41,062	11,433 61						41,062	11,433 61		
	" Railway	5,926	1,800 30						5,926	1,800 30		
	Morrell.	28,755	8,865 00						43,325	11,692 59		
	Charlottetown Ry. Wharf.	86,151	22,162 30	110,721 32	14,580	3,107 59	7,720 37		86,151	22,162 30	118,441 69	
	" Pownal.	14,193	2,963 50						14,193	2,963 50		
	" Ferry.	10,075	2,006 99						10,075	2,006 99		
	" Steam Nav. Co.	13,113	5,491 77						13,113	5,491 77		
	" Connolly Wharf	9,978	4,409 68						9,978	4,409 68		
	" Peake Bros.	12,195	5,362 46						12,195	5,362 46		
	" Queen St. Slip.	3,915	1,109 03						3,915	1,109 03		
	" Geo. Peake Whf	5,805	1,644 42						5,805	1,644 42		
	" Poole.	12,240	1,609 95						12,240	1,609 95		
	" McMillan.	6,165	1,320 13						6,165	1,320 13		
	" Don. Building Sewer.	5,355	1,146 68						5,355	1,146 68		
	" Public Sewerage	2,880	679 12						2,880	679 12		
	Webster's Corners, E. River	203	43 47						203	43 47		
	Crapaud, Victoria.	118,040	34,574 90						118,040	34,574 90		
Pownal Bay.	33,610	6,536 20						33,610	6,536 20			
Rocky Point.	82,920	13,426 13						82,920	13,426 13			
Vernion River.	25,240	8,292 55						25,240	8,292 55			
Wood Islands.	2,780	548 00						8,405	9,951 45			
Nine Mile Creek	31,650	6,286 46		5,625	9,403 45			31,650	6,286 46			

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Hickey Wharf	750	150 51			750	150 51	
Carr's Point	12,165	2,441 28			12,165	2,441 28	
Puette	3,825	736 24			3,825	736 24	
Port Augustus	3,195	631 68			3,195	631 68	
Southport Ferry	45,300	7,508 75			45,300	7,508 75	
Red Point	7,161	3,879 60			7,161	3,879 60	
North Rustico	13,536	4,775 38			13,536	4,775 38	
South Rustico	11,649	4,109 67			11,649	4,109 67	
Gauthier's Creek	17,847	8,305 50			17,847	8,305 50	
Malbecque	28,575	3,483 32			28,575	3,483 32	
French River	41,671	13,311 46			41,671	13,311 46	
Bay View	1,995	1,912 87			1,995	1,912 87	
Wedlocks	1,260	520 48			1,260	520 48	
Belfast, Halliday's Wharf	15,435	4,468 78		9,403 45	15,435	4,468 78	185,272 71
Summerside	91,571	28,032 51			91,571	28,032 51	
Hurd's Point Pier	65,505	14,315 47			65,505	14,315 47	
Tignish	11,387	13,005 45			11,387	13,005 45	
Casampec	1,157	538 42			1,157	538 42	
Cape Traverse	16,740	5,105 89			16,740	5,105 89	
Holman's Wharf	9,585	1,269 21		62,246 95	9,585	1,269 21	62,246 95
Total	1,385,771	348,857 53	33,030	17,123 82	1,418,801	365,981 35	365,981 35

Prince.

## EXPENDITURE for dredging in Quebec for the thirty-three years ended June 30, 1905.

From appropriations Maritime Provinces.

Magdalen Is-							
lands, Co. Gaspé	6,800	2,392 92			6,800	2,392 92	
Magdalen Is-							
lands, Co. Gaspé	495	242 05			495	242 05	2,634 97
River du Loup	2,587	825 47			2,587	825 47	825 47
Rimouski	8,123	3,997 59			8,123	3,997 59	3,997 59
Total	18,005	7,458 03	Nil.	Nil.	18,005	7,458 03	7,458 03

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STATEMENT of Dredging, showing Quantities Removed in each Province, and Cost of each Work for the Thirty-three Years ended June 30, 1905.

Fiscal Year.	NEW BRUNSWICK.		NOVA SCOTIA.		QUEBEC.		PRINCE EDWARD ISLAND.		Total Quantity, Cubic Yards.	Total Expenditure.	Cost per Cubic Yard.
	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.			
1872-3	38,000	\$ 13,240 50	23,200	\$ 8,422 70	6,800	\$ 2,392 92	.....	.....	61,320	\$ 21,663 20	0. 35 328
1873-4	57,725	14,395 57	18,600	6,545 61	.....	.....	.....	.....	83,125	23,334 10	0. 28 71
1874-5	78,223	17,325 05	24,416	13,238 83	.....	.....	.....	.....	121,294	40,456 77	0. 33 354
1875-6	79,935	17,040 52	31,974	21,885 90	.....	.....	.....	.....	230,192	49,818 22	0. 21 642
1876-7	97,690	23,161 90	127,785	34,846 74	.....	.....	.....	.....	299,955	70,766 91	0. 23 394
1877-8	81,670	23,325 92	106,857	29,697 94	.....	.....	.....	.....	265,352	64,943 04	0. 23 983
1878-9	132,555	27,400 22	116,307	28,267 59	.....	.....	.....	.....	270,787	64,943 04	0. 21 951
1879-1880	63,540	16,581 79	127,684	34,765 84	765	37 4 08	.....	.....	228,379	64,396 69	0. 28 197
1880-1	44,315	12,385 85	87,118	33,063 64	2,317	683 44	.....	.....	180,085	45,439 46	0. 25 232
1881-2	79,640	18,236 87	89,566	33,063 71	.....	.....	.....	.....	216,531	61,347 15	0. 28 331
1882-3	48,565	13,422 70	143,616	42,996 93	.....	.....	.....	.....	180,880	67,500 00	0. 25 890
1883-4	47,058	17,103 38	157,560	49,050 58	.....	.....	.....	.....	290,716	79,509 01	0. 27 959
1884-5	128,997	24,460 35	76,164	25,250 73	.....	.....	.....	.....	268,359	62,376 68	0. 23 242
1885-6	68,505	14,874 63	56,790	21,482 05	.....	.....	.....	.....	142,432	46,706 34	0. 32 793
1886-7	69,440	11,452 86	53,400	23,621 19	.....	.....	.....	.....	128,977	43,288 79	0. 33 56
1887-8	50,132	9,232 50	84,175	23,847 60	.....	.....	.....	.....	138,102	44,000 00	0. 32 58
1888-9	63,633	16,598 08	50,910	23,697 00	.....	.....	.....	.....	144,783	63,798 03	0. 27 29
1889-1890	86,068	20,544 93	59,783	22,821 55	.....	.....	.....	.....	177,273	54,451 87	0. 30 71
1890-1	96,588	20,375 06	61,698	24,386 37	.....	.....	.....	.....	177,290	53,603 55	0. 30 23
1891-2	75,023	20,592 85	81,993	27,376 08	.....	.....	.....	.....	188,398	60,757 27	0. 32 249
1892-3	108,935	23,742 26	40,834	18,125 58	.....	.....	.....	.....	215,454	56,990 67	0. 26 44
1893-4	77,505	21,594 11	59,581	28,064 99	.....	.....	.....	.....	213,622	62,498 50	0. 26 38
1894-5	50,715	13,630 27	105,463	32,202 70	.....	.....	.....	.....	213,288	56,261 71	0. 27 65
1895-6	98,905	21,352 63	36,428	15,828 89	.....	.....	.....	.....	380,788	87,068 94	0. 19 73
1896-7	203,975	34,080 86	84,735	22,080 46	.....	.....	.....	.....	381,130	69,810 23	0. 18 31
1897-8	187,325	27,611 17	147,085	31,497 57	.....	.....	.....	.....	311,608	72,228 34	0. 23 50
1898-9	105,058	23,315 82	152,510	36,628 81	.....	.....	.....	.....	422,332	85,353 41	0. 26 91
1899-1900	175,935	23,232 46	132,633	37,089 22	.....	.....	.....	.....	325,946	87,740 39	0. 26 69
1900-1	206,369	32,615 29	94,357	36,141 17	.....	.....	.....	.....	405,682	85,963 27	0. 21 97
1901-2	218,210	38,508 97	143,142	30,247 35	.....	.....	.....	.....	387,798	85,212 66	0. 25 44
1902-3	197,297	36,135 40	134,648	32,856 93	.....	.....	.....	.....	396,900	100,992 94	0. 25 44
1903-4	252,725	53,046 12	94,975	33,359 47	.....	.....	.....	.....	430,445	96,832 18	0. 22 49
1904-5	193,955	46,348 89	293,460	33,359 47	.....	.....	.....	.....	8,098,324	2,056,411 85	0. 25 39
Totals.....	3,569,701	742,373 78	3,067,807	933,931 37	18,005	7,458 03	1,418,801	372,648 67			



STATEMENT of dredging in the Maritime Provinces, showing quantities removed by and expenditure of each dredge during the thirty-three years ended June 30, 1905.

Dredge.	TOTAL QUANTITIES AND COST FOR THIRTY-TWO YEARS ENDING JUNE 30, 1904.				1904-1905.				TOTAL FOR THIRTY-THREE YEARS ENDED JUNE 30, 1905.			
	Total Quantity.	Cost.	Per cubic yard.	Quantity.	Cost.	Per cubic yard.	Total Quantity.	Total cost.	Cost per cubic yard.	Total Quantity.	Total cost.	Cost per cubic yard.
		\$ cts.	\$ cts.		\$ cts.	\$ cts.		\$ cts.	\$ cts.		\$ cts.	\$ cts.
St. Lawrence.....	1,547,231	402,879 35	0' 26 03	82,600	11,533 82	0' 13 96	1,629,831	414,413 17	0' 25 42	1,629,831	414,413 17	0' 25 42
Canada .....	1,002,034	319,368 66	0' 31 87	48,810	12,741 33	0' 26 10	1,050,841	332,109 99	0' 30 55	1,050,841	332,109 99	0' 30 55
New Dominion .....	1,670,592	285,133 22	0' 17 06	63,310	13,627 68	0' 21 52	1,733,902	298,760 90	0' 17 23	1,733,902	298,760 90	0' 17 23
Prince Edward .....	1,349,411	348,065 47	0' 25 79	33,030	17,123 82	0' 51 88	1,382,441	365,189 29	0' 26 41	1,382,441	365,189 29	0' 26 41
(Old) Cape Breton .....	534,938	139,074 33	0' 25 99	.....	.....	.....	534,938	139,074 33	0' 25 99	534,938	139,074 33	0' 25 99
Geo. McKenzie .....	707,575	237,383 35	0' 42 02	27,340	10,647 84	0' 38 94	734,915	308,081 19	0' 41 91	734,915	308,081 19	0' 41 91
Cape Breton .....	604,630	107,611 82	0' 17 79	122,250	16,572 32	0' 13 55	726,880	124,184 14	0' 17 08	726,880	124,184 14	0' 17 08
New Brunswick.....	233,560	53,565 88	0' 22 36	53,105	14,585 37	0' 27 46	292,665	68,151 25	0' 23 28	292,665	68,151 25	0' 23 28
	7,655,791	1,953,082 08	0' 25 51	430,445	96,832 18	0' 22 49	8,086,416	2,049,914 26	0' 25 35	8,086,416	2,049,914 26	0' 25 35

## SESSIONAL PAPER No. 19

STATEMENT of dredging performed by hand in the Maritime Provinces, showing quantities removed and expenditure at each locality for the thirty-three years ended June 30, 1905.

Locality.	TOTAL QUANTITIES AND COST FOR THIRTY-TWO YEARS ENDING JUNE 30, 1904.				1904-1905.				Total Quantity.	Total cost.		Cost per cubic yard.
	Total Quantity.	Cost.	Per cubic yard.		Quantity.	Cost.	Per cubic yard.					
			\$	cts.			\$	cts.		\$	cts.	
Parrsboro', N.S.	42,595	12,804 68	0	30 06					42,595	12,804 68	0	30 06
Windsor, N.S.	5,450	1,627 60	0	29 86					5,450	1,627 60	0	29 86
Milton, N.S.	663	499 46	0	75 33					663	499 46	0	75 33
Racquetts, N.S.	1,645	496 38	0	30 17					1,645	496 38	0	30 17
	50,353	15,428 12	0	30 64					50,353	15,428 12	0	30 64



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## PROVINCE OF QUEBEC.

## DREDGING IN THE BARBOTTE RIVER.

The dredge 'Richelieu' worked at this place from July 4 to 16, 1904, making an entrance from the Richelieu river. Five cuts were made: two 73 feet long, two 100 feet long and one 184 feet long; 25 feet wide and to a depth of 7 feet at low water. As these cuts were made parallel a channel was made at the mouth of this river 125 feet wide. The quantity of material removed was: 3,200 cubic yards of sand and clay.

## DREDGING AT BATISCAN.

The dredge 'Pontiac' (leased) worked at this place between June 26 and 30, 1905, the close of fiscal year. Two cuts were made, near the Canadian Pacific Railway bridge, 1,000 feet long each, 20 feet wide and to a depth of from 6 to 7 feet at low water.

4,080 cubic yards of clay, stone and sand were removed.

## DREDGING IN THE BEAUHARNOIS CHANNEL.

From September 5 to October 1st, and between October 24 and November 5, 1904, the close of navigation, the dredge 'Central City' (leased) was engaged in widening this channel. One cut was made 1,655 long, 20 feet wide and to a depth of 12 feet at low water.

The quantity of material removed consisted of 12,560 cubic yards of boulders, hardpan and clay.

## DREDGING AT BELCEIL.

Work was started at this place by the dredge 'Richelieu' between September 23 and 30, 1904, dredging through boulder shoals at the Grand Trunk Railway bridge, at Parizeau's wharf and at the government dam. Four cuts were made: two 50 feet long, on 25 feet long, and one 132 feet long; 9 feet wide and 10 feet deep at low water.

570 cubic yards of hardpan and boulders were removed.

Operations were resumed at this place by the dredge 'Richelieu' on May 26, 1905. One day's work was done at this place, removing a sunken pier one half mile below the railway bridge near edge of channel.

## DREDGING AT BERTHIER EN BAS.

Dredge 'Nithsdale' worked at this place between June 15 and 30, 1905, the close of the fiscal year. One cut was made 250 feet long, 20 feet wide and 8 feet deep at low water, on the west side of the wharf.

The material removed was 3,150 cubic yards of clay, stone, sand and mud.

## DREDGING AT BLANCHE SHOALS.

Between September 8 and November 14, 1904, the dredge 'T. F. M. No. 1' (leased) made one cut through a sand shoal, opposite the Big Blanche, 832 feet long. The other cuts were made at the foot of this shoal opposite the Little Blanche, 868 feet long. All these cuts were made 22 feet wide and to a depth of 10 feet at low water.

The quantity of material removed was 27,350 cubic yards of sand and clay.

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This same dredge worked at this place between June 7 and 30, 1905, the end of the fiscal year, continuing the work done the previous season. One cut was made 974 feet long, 22 feet wide and 10 feet deep at low water.

Seven thousand one hundred cubic yards of boulders, clay and sand were removed.

## DREDGING AT CALUMET.

The dredge 'T.F.M. No. 1' (leased), worked at this place between July 1 and 23, 1904, continuing the work done the previous fiscal year. One cut was made along the Canadian Pacific Railway's wharf into the mill, 576 feet long, 22 feet wide and 10 feet deep at low water.

The material taken out was 9,400 cubic yards of sand and stone.

## DREDGING AT CHAMBLY.

From May 20 to 25, 1905, dredge 'Richelieu' worked at this place making one cut, 115 feet long, 25 feet wide and 9 feet deep at low water, on the approach to Ducharme's boat house.

Nine hundred and fifty cubic yards of hard-pan, boulders and clay were removed.

## DREDGING AT CHATEAUGUAY BASIN.

Dredging was done in this place between July 1 and September 3, and also from October 3 to 22, 1904, by the dredge 'Central City' (leased.) Four cuts were made along the front of the wharfs in the basin, 475 feet long each, 20 feet wide and to a depth of 12 feet at low water.

Sixteen thousand three hundred and twenty cubic yards of hard-pan and boulders were removed.

## DREDGING AT CHARLEMAGNE.

Between November 10 and 15, 1904, the close of navigation, dredge 'Otto' (leased), worked at this place. The channel was deepened in front of McLaren's wharf.

Two thousand cubic yards of stone and gravel were removed.

## DREDGING AT CHICOUTIMI.

The dredge 'Lady Minto' commenced work at the foot of the batture, eight miles below Chicoutimi, going up.

The channel was dredged for a distance of 3,000 feet on a width of 250 feet, giving a depth of water of 18 feet at low water spring tides.

The quantity of material removed was 141,100 cubic yards of clay and sand; a great quantity of boulders were removed. Dredging was resumed this spring by the spoon dredge 'International.'

Dredging was done in front of the Chicoutimi wharf, so as to give a depth of water of 14 feet, at low water spring tides.

The tug 'Storm-King' attended the dredge.

## DREDGING AT COMO.

Between October 17 and November 15, 1904, the close of navigation, the dredge 'No. 4 Cohen' (leased), worked at this place, making two cuts 186 and 235 feet long, 22 feet wide and 8 feet deep at low water. The dredging was done at Hodgins' wharf to allow vessels to reach the wharf to load lumber. 2,495½ cubic yards of hard-pan and stones were removed.

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## DREDGING AT DOUCET'S LANDING.

Dredging operations were performed at this place by the dredge 'Pontiac' from October 4 to 31, 1904, under contract.

The quantity of material removed was 19,043 cubic yards of clay, stone and sand.

From June 2 to 24, 1905, the dredge 'No. 5', also worked here under contract, removing 28,501 cubic yards of boulders, clay and sand.

## DREDGING AT GRAHAM.

Between June 5 and 30, 1905, the close of the fiscal year, the dredge 'No. 4, G.C. Co.' (leased), was working at this place. One cut was made from the wharf out to the channel, 3,090 feet long, 26 feet wide and 10 feet deep at low water.

18,550 cubic yards of clay were removed.

## DREDGING AT GRENVILLE.

Work was performed at this place by the dredge 'T.F.M. No. 1' (leased), between July 26 and September 5, 1904, making one cut in front of Dansereau's wharf, and leading out to the main channel, 1,177 feet long, 22 feet wide and to a depth of 9 feet at low water.

15,750 cubic yards of sand and boulders were removed.

## DREDGING AT ILE DU PAS.

Between May 18 and June 6, 1905, the dredge 'St. Louis' worked at this place. One cut was made between Ile aux Castors and Ile Dupas, deepening the channel; 682 feet long, 25 feet wide and to a depth of  $7\frac{1}{2}$  feet at low water.

3,947 cubic yards of clay and sand were removed.

## DREDGING AT ISLE-AUX-NOIX.

Work was performed at this place by the dredge 'Richelieu' from July 19 to August 17, 1904, removing a shoal on the flats, opposite the range lights, to straighten the channel. Three cuts were made: 650, 575 and 525 feet long, 20 feet wide and to a depth of 9 feet at low water. 7,150 cubic yards of sand were taken out.

## DREDGING AT LACOLLE.

Work was commenced at this place by the dredge 'Richelieu' on June 2, 1905, and continued there up to the 20th of the same month. Work was done along Wilson's wharf. Three cuts were made, 235, 60 and 20 feet long, 25 feet wide and 6 feet deep at low water.

The material removed was 2,300 cubic yards of hard-pan, boulders, clay and sand.

## DREDGING AT L'ASSOMPTION.

Dredge 'No. 4 Daly' (leased) worked at this place from July 1 to November 15, 1904, the close of navigation. Six cuts, 1,200 feet long each, were made on the big shoal near Bourbon Island. Two cuts in front of Repentigny's Landing, 500 and 200 feet long. One cut in the channel near Vaudry's Island, 700 feet long. And one cut at the wharf of the Charlemagne Lumber Co., 1,300 feet long. All the above cuts were made to a width of 25 feet and to a depth of 12 feet at low water.

The material removed consisted of 62,680 cubic yards of clay, mud and stones.

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The dredge 'Quebec' (leased) performed the work at this place between June 12 and 30, 1905, the close of the fiscal year. One cut was made 674 feet long, 20 feet wide and 13 feet deep at low water, in the channel in front of the Ferry Dock wharf.

14,710 cubic yards of clay were removed.

## DREDGING AT MURRAY BAY.

Between October 1 and November 12, 1904, the close of navigation, the dredge 'Progress' worked at this place, dredging on the east side of the wharf, to a depth of 12 feet, as a protection to vessels from westerly winds.

15,900 cubic yards of clay, stone and silt were removed.

## DREDGING AT NOTRE-DAME DE PIERREVILLE.

Operations were started at this place by the dredge 'St. Louis' from June 9 to 30, 1905, the close of the fiscal year. The work consisted in deepening the channel in front of Ile St. Joseph. One cut was made 1,177 feet long, 25 feet wide and 9 feet deep at low water.

3,540 cubic yards of clay and sand were removed.

## DREDGING IN THE OTTAWA RIVER.

Between July 14 and November 11, 1904, the close of navigation, the dredge 'Challenge' worked at this place, deepening the channel from the main channel in the Ottawa river to the Hawkesbury Lumber Company's wharfs. Seven cuts were made: 213, 650, 208, 856, 80 and two 224 feet long; all to an average width of 25 feet and to a depth of 10 feet at low water. The quantity of material removed consisted of 13,090 cubic yards of sand, boulders and hard-pan.

Dredge 'Challenge' continued work at this place from June 1 to 30, 1905, the close of the fiscal year, on same work as the previous season. Seven cuts were made: 56, 35, 202, 212, 53, 104 and 336 feet long, 25 feet wide and 10 feet deep at low water. The material removed was 4,850 cubic yards of hard-pan, boulders and sand.

## DREDGING AT PENTECOST.

Between August 27 and October 6, 1904, the dredge 'International' worked at this place. The work consisted in dredging a foundation for crib work for new wharf, also the deepening of the channel from the harbour out to deep water.

48,000 cubic yards of hard-pan, boulders and sand were removed.

## DREDGING AT POINTE PLATON.

From October 24 to 27, 1904, the dredge 'Nithsdale' worked at this place, in front of the wharf making one cut 200 feet long, 20 feet wide and to a depth of 10 feet at low water.

One thousand seven hundred and fifty cubic yards of sand were taken out.

## DREDGING AT QUEBEC.

Work was performed at this place by the dredge No. 6, between May 19 and June 30, 1905, the close of the fiscal year. One cut was made in front of Archer and Company's dock, 210 feet long, 40 feet wide and to a depth of 10 feet at low water.

21,120 cubic yards of boulders and sand were removed.

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Dredging was also done at this place by the dredge 'Progress' from May 10 to June 30, 1905, the close of the fiscal year. Two cuts were made on the approach to the new breakwater under construction; 700 and 300 feet long, 40 feet wide and 15 feet deep at low water.

The material removed was 18,720 cubic yards of clay, stone and silt.

The dredge 'International' also worked at this place between July 1 and 15, October 25 and November 22, 1904, the close of navigation; also between May 4 and June 17, 1905. The work done consisted in dredging material for back filling for continuation of new wharf at Louise basin.

The material removed consisted of 77,300 cubic yards of hard-pan, boulders and sand.

## DREDGING AT RIGAUD.

Work was performed at this place by the dredge 'No. 4 Cohen' (leased), between July 1 and October 15, 1904. Two cuts were made in the channel near the Canadian Pacific Railway bridge, 1,355 feet long each, 22 feet wide and to a depth of 12 feet at low water.

The amount of material removed at this place consisted of 35,652½ cubic yards of clay and sand.

The dredge 'Chateauguay' worked at this place under contract, from June 2 to 30, 1905, continuing the work performed during the previous season.

The quantity of material removed was 11,060 cubic yards of boulders, gravel and clay.

## DREDGING AT RIVIÈRE OUELLE.

The dredge 'Progress' started work at this place on August 1, and continued there up to September 24, 1904, dredging in front and on both sides of the wharf, for the purpose of making a harbour of refuge, principally for the Murray Bay and River Ouelle ferry.

16,000 cubic yards of clay and silt were removed.

## DREDGING IN THE RIVER JESUS.

From July 1 to October 15, 1904, the dredge 'Otto' (leased), worked at this place, making one cut in front of McDonald's wharf, 2,500 feet long, 21 feet wide and to a depth of 8 feet at low water.

81,565 cubic yards of hard-pan and stone were removed.

## DREDGING AT RIVIÈRE DU LOUP.

Dredge 'No. 6, McDonald' (leased), operated at this place from May 29 to June 30, 1905, the close of the fiscal year. The work consisted in deepening and widening the channel. Four cuts were made, 1,664, 740, 231 and 456 feet long, 30 feet wide and 13 feet deep at low water.

33,300 cubic yards of clay, sand and logs were removed.

## DREDGING AT ROBERVAL.

The dredge 'P. V. Savard' worked here, removing 2,800 cubic yards of clay and a large quantity of saw-dust.

## DREDGING AT ST. AIMÉ.

Work was done at this place by the dredge 'St. Louis,' from July 1 to October 15, 1904, deepening the channel in the river. Two cuts were made, 2,529 and 2,500 feet long, 25 feet wide and to a depth of 8 feet at low water.

The material removed consisted of 12,015 cubic yards of sand.

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## DREDGING AT ST. ANDREWS.

Dredging was performed at this place by the dredge 'Little Giant' (leased), between August 18 and November 12, 1904, the close of navigation. The work done at this place consisted of deepening the channel through the rapids to enable vessels to reach the wharfs. One cut was made 1,000 feet long, 26 feet wide and 11 feet deep at low water. The material removed at this place was 7,560 cubic yards of hard-pan and boulders.

## DREDGING AT ST. ANTOINE.

Between August 22 and September 22, 1904, the dredge 'Richelieu' started work in front of Miller's hay slide, where three cuts were made: 270, 250 and 27 feet long, 12 feet wide and to a depth of  $7\frac{1}{2}$  feet at low water. Six cuts were also dredged in front of Lapierre's wharf: 50, 60, 70, 75, 95 and 127 feet long, 15 feet wide and to a depth of  $7\frac{1}{2}$  feet at low water. Three other cuts were also made in front of Gendron's wharf: 50, 60 and 53 feet long, 15 feet wide and  $7\frac{1}{2}$  feet deep at low water.

The material removed was 6,300 cubic yards of clay and boulders.

## DREDGING AT ST. DENIS.

From October 3 to 22, 1904, the dredge 'Richelieu' worked at this place, dredging at Lamothe's hay slide and at Bousquet's wharf. Six cuts were made: 210, 215, 190, 32, 50 and 95 feet long; 15 feet wide and to a depth of 7 feet at low water. 6,900 cubic yards of clay were removed.

## DREDGING AT ST. CHARLES.

Dredge 'Richelieu' worked at this place between October 26 and November 7, 1904, the close of navigation. One cut was made from the channel in the Richelieu river to the mouth of the Amyot river, 461 feet long, 20 feet wide and to a depth of 7 feet at low water. 2,620 cubic yards of clay were removed.

## DREDGING AT ST. JEAN DES CHAILLONS.

Operations were performed at this place by the dredge 'Nithsdale' between July 1 and 16, and from October 29 to November 12, 1904, the close of navigation. One cut, 1,000 feet long, 20 feet wide and 8 feet deep, was made in front of the brick yards.

The amount of material removed consisted of 6,650 cubic yards of sand.

## DREDGING AT ST. JOHNS.

The dredge 'Richelieu' worked at this place between May 11 and 13, and also from June 22 to 30, 1905, the close of the fiscal year. The work done consisted of one cut at Singer's wharf, for the Department of Railways and Canals, near entrance to lock, 175 feet long, 12 feet wide and 8 feet deep at low water. One cut was also made at end of dam, 50 feet long, 25 feet wide and 6 feet deep at low water. Two other cuts were also made at end of dam, 50 feet long, 25 feet wide and 6 feet deep at low water. Two other cuts were also made above V. C. bridge, 98 feet long each, 25 feet wide and to a depth of 6 feet at low water.

The quantity of material removed was 2,712 cubic yards of hard-pan, boulders, clay and sand.

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## DREDGING AT ST. MICHEL DE BELLECHASSE.

Dredge 'Nithsdale' started work at this place on July 19 and worked up to October 22, 1904, making a number of small cuts in different places, in the channel through the bar, which makes the total length of cuts made 850 feet long, 20 feet wide and 8 feet deep at low water.

The material removed consisted of 9,240 cubic yards of sand.

## DREDGING AT ST. MAURICE RIVER.

Dredging operations were performed at this place by the dredge 'Duke of York,' between May 6 and June 30, 1905, widening and deepening the channel.

The material removed consisted of 47,646 cubic yards of clay, stone and sand.

## DREDGING AT SOREL.

The dredge 'St. Louis' worked at this place between November 10 and 26, 1904, the close of navigation. The work was done at the government wharf. 810 cubic yards of sand were removed.

Work was also done at this place by the dredge 'Nithsdale' between May 9 and June 8, 1905. Two wrecks were removed in the harbour, which were interfering with navigation.

The dredge 'Progress' also worked at this place from July 1 to 31, 1904, removing wrecks and old cribs in the vicinity of the ship yard wharfs.

240 cubic yards of clay, stone and silt were removed.

## DREDGING AT TERREBONNE.

Dredge 'Otto' (leased), worked at this place from October 17 to November 9, 1904, making one cut in the channel, 635 feet long, 21 feet wide and 8 feet deep at low water.

5,800 cubic yards of stone and gravel were removed.

## DREDGING AT THREE RIVERS.

Dredge 'No. 5' was engaged at this place from June 26 to 30, 1905, under contract, and removed 120 cubic yards of boulders, clay and sand.

## DREDGING AT VILLE MARIE.

Dredging was performed by the dredge 'Queen' between August 3 and 12, 1904, continuing the work done the previous season in front of the wharf, making one cut 400 feet long, 26 feet wide and to a depth of 7 feet at low water mark. The quantity of material removed consisted of 2,625 cubic yards of clay.

## DREDGING AT YAMASKA.

Between September 3 and 30, and also from October 17 to November 8, 1904, the dredge 'St. Louis' worked at this place, making two cuts in the channel, near the bridge, 2,083 and 62 feet long, and one cut near Ile St. Jean, 1,749 feet long. All these cuts were made to a width of 25 feet and a depth of 8 feet at low water.

8,458 cubic yards of sand were removed.

The dredge 'St. Lawrence' (leased), also worked at this place from June 14 to 30, 1905, the end of the fiscal year. Two cuts were made in the channel a length of 1,985 feet, 20 feet wide and 8 feet deep at low water.

The material removed consisted of 9,600 cubic yards of clay and sand.



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## PROVINCE OF ONTARIO.

## DREDGING AT BRONTE.

Between August 23rd and September 24th, 1904, the dredge 'Nipissing' worked at this place. Four cuts were made in the harbour between the piers, 150, 685, 480 and 600 feet long, 27 feet wide and to a depth of 14 feet at low water. The quantity of material removed was 15,262½ cubic yards of rock, clay and sand.

## DREDGING AT COBOURG.

The dredge 'St. Lawrence' (leased) worked at this place from October 12th to November 15th, 1904, the close of navigation. The work consisted in deepening between the east and centre piers. Two cuts were made from the entrance to the break-water, 1,000 feet long each, 30 feet wide and to a depth of 14 feet at low water. Two other cuts were made along the north and east pier, in the inner basin, 200 and 100 feet long, 30 feet wide and to a depth of 14 feet at low water.

The amount of material removed at this place was 18,360 cubic yards of sand and clay.

## DREDGING AT COLLINGWOOD.

Operations were performed at this place between July 1st and November 30th, 1904, the close of navigation, by the dredge 'No. 7 Coghill' (leased). The work consisted in deepening the harbour in front of the docks and at entrance to pond. Five cuts were made: 451, 790, 198, 320 and 690 feet long, to an average width of 25 feet and to a depth of 8 feet at low water. All the material removed was cast over.

About 34,857 cubic yards of clay and boulders were removed.

Dredge 'No. 1 C. S. Boone' worked at this place under contract, from June 24th to 30, 1905, the end of the fiscal year. One cut was made, in the same location as the previous season, 332 feet long, 24 feet wide and 9 feet deep at low water.

The material removed was 3,576 cubic yards of rock, gravel, mud and slabs.

Dredge 'No. 14' also worked at this place under contract, from June 3rd to 30th, 1905.

Removed 19,170 cubic yards of rock and mud.

## DREDGING AT CUMBERLAND.

Dredge 'T. F. M. No. 1' (leased) worked at this place from November 15th to 18th, 1904, the close of navigation. One cut was made in front of the ferry wharf, 80 feet long, 22 feet wide and 7½ feet deep at low water.

1,150 cubic yards of boulders were removed.

## DREDGING IN GRAND RIVER.

Grand river runs into Lake Erie after passing through the Counties of Brant and Haldimand.

Authority was given on June 11, 1904, to employ Mr. C. S. Boone's dredging plant to do the necessary dredging in the Grand river, at Dunnville.

Work was continued after July 1st and completed on September 24th. The dredge worked 645 hours removing 31,828 cubic yards of material. Of the hours worked, 245 hours time was expended in casting over material at Sunfish Creek for which no yardage was returned.

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## DREDGING AT GODERICH.

The dredge 'Arnoldi' worked at this place from June 5 to 24, 1905, and removed 10,015 cubic yards of sand.

## DREDGING AT HAILEYBURY.

From May 30th to June 3rd, 1905, the dredge 'Queen' worked at this place, removing two sunken piers with about 400 cubic yards of stone filling.

Also 285 cubic yards of sand, clay and stone.

## DREDGING AT HAMILTON.

Operations were performed at this place between July 1 and August 23, and also from September 27 to November 15, 1904, the close of navigation, by the dredge 'Nipissing.' Five cuts were made at the Turbine Company's wharf, 350, 375, 50, 45 and 150 feet long, 30 feet wide and 14 feet deep at low water. One other cut was made at the International Harvester Company's dock, 1,050 feet long, 30 feet wide and 16 feet deep at low water. Ten cuts were also made at McKay's wharf, McIlwraith's wharf and Brown's wharf, 350, 120, 250, 200, 200, 120, 250, 180, 250 and 100 feet long. 30 feet wide and to a depth of 14 feet at low water. The total quantity of material removed consisted of 48,862½ cubic yards of clay and sand.

## DREDGING AT HAWKESBURY.

From July 1 to August 16, 1904, the dredge 'Little Giant' (leased), worked at this place. Four cuts were made in front of Higginson's wharf, leading out to the main channel, 500 feet long each, 26 feet wide and to a depth of 7 feet at low water.

The quantity of material removed was 18,355 cubic yards of hardpan and stone.

On June 2, operations were resumed at this place by the same dredge under contract, continuing the work of widening and deepening the channel between the town wharfs and the main channel.

9,740 cubic yards of hardpan, boulders and sand were removed.

## DREDGING IN INDIAN RIVER.

Indian River runs through the township of Douro, Dummer and Otonabee, from Stoney Lake to Rice lake.

At the last session of parliament, the sum of \$3,000 was appropriated to dredging a channel at this place, and authority was given on September 10, to expend same.

Work was commenced on May 18, and is still in progress.

Total expenditure for fiscal year, 1904-05 :—

Labour and superintendence. . . . .	\$ 667 75
Materials. . . . .	601 56
	<hr/>
	\$1,269 31

## DREDGING IN KAMINISTQUIA RIVER.

During the first part of last fiscal year the channel of the river was widened and deepened in places to a depth of 22 feet below zero of gauge, from Mission river up to the Canadian Northern railway coal docks, at West Fort William.

Dredging was also done in front of the Ogilvie elevator and the Canadian Pacific Railway elevators A. B. C.

The entrance channel to the River Kaministiquia was widened and deepened, and all dredging done to 22 feet below zero.

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A channel, 140 feet in width and 22 feet in depth below zero, was dredged in front of the Empire Elevator Company's wharf.

During the past winter, soundings were taken in the entrance channel to the river from the Canadian Pacific railway coal docks for a distance out of 6,200 feet; it was found that considerable filling had taken place since dredging was done, and that the channel will require to be cleaned up every season.

The total amount of material removed during 1904-05, is 585,806 cubic yards.

## DREDGING AT KINCARDINE.

The dredge 'Arnoldi' worked at this place from June 28 to 30, 1905, deepening the harbour, and removed 670 cubic yards of sand.

## DREDGING AT KINGSTON.

Between September 15 and November 23, 1904, the close of navigation, the dredge 'Sir Richard' worked at the place making seven cuts in front of the Kingston and Pembroke Railway coal dock. The lengths of the cuts made were 50, 80, 110, 140, 170, 200 and 230 feet long. Two cuts were also made in front of Anglin's dock, leading out to the channel, 340 and 180 feet long. All the above cuts were made to a width of 25 feet and to a depth of 12 to 14 feet at low water. The quantity of material removed consisted of 25,900 cubic yards of hardpan and clay.

## DREDGING AT KINGSTON.

Work was resumed at this place by the dredge 'Nipissing' on May 22, and continued there up to June 30, 1905, the end of the fiscal year. The work was done on the approach and in front of the Kingston and Pembroke Railway Company's coal dock. Eight cuts were made: 200, 500, 500, 500, 200, 100, 150 and 150 feet long, all dredged to a width of 30 feet and to a depth of 14 feet at low water. The material removed was 19,240 cubic yards of hard-pan, boulders, clay and sand.

## DREDGING AT LITTLE CURRENT.

Little Current, a town of 300 inhabitants is situated on the east shore of Manitoulin island, on the north channel of Georgian bay.

At the last session of parliament, the sum of \$22,000 was appropriated for deepening steamer channel at this place, and authority was given on May 23 to expend the amount.

An agreement was entered into with Mr. C. S. Boone to do this work. Dredging was commenced on September 1 last, and closed for season, November 1, and was resumed on April 4 and continued until June 30, but only drilling plant was employed at this place since April.

The dredging plant worked 498½ hours removing 20,075½ cubic yards rock, scow measurement.

Total expenditure for fiscal year, 1904-05, \$38,124.50.

## DREDGING AT MIDLAND.

Dredging operations were performed at this place by dredge 'No. 9,' between May 8 and 11, and between June 17 and 30, 1905, deepening in front of the Grand Trunk Railway elevator in the Midland harbour. 7,800 cubic yards of hardpan, boulders, clay and sand were removed.

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## DREDGING IN NEEBING RIVER.

Dredge 'No. 6' worked at this place under contract, from June 1 to 30, 1905, deepening the channel.

The material removed consisted of 50,514 cubic yards of quicksand, clay and mud.

The Hydraulic dredge also worked at this place from May 29 to June 30, 1905, deepening the channel to 14 feet at low water. 8,148 cubic yards of sand were removed.

## DREDGING AT NEW LISKEARD.

Dredge 'Queen' worked at New Liskeard, between July 1 and 30, and from August 13 to November 15, 1904, the close of navigation. Seven cuts were made in the channel where left off the previous year, 1,200, 500, 500, 1,500, 150, 800 and 300 feet long. All cuts were made to a width of 26 feet and a depth of from 5 to 9 feet at low water. 21,740 cubic yards of clay were removed.

The dredge 'Queen' resumed work at this place, between June 5 and 30, 1905, the close of the fiscal year. One cut was made at the entrance of the Wabi river, 1,025 feet long, 22 feet wide and 9 feet deep at low water. The quantity of material removed was 7,420 cubic yards of sand, stone and clay.

## DREDGING AT OWEN SOUND.

From May 18 to June 24, 1905, the dredge 'Frank' (leased), worked at this place in front of the Grand Trunk Railway freight sheds and in front of the Canadian Pacific Railway elevator. Two cuts were made, 1,350 and 875 feet long, 23 feet wide and 23 feet deep at low water.

34,965 cubic yards of clay and sand were taken out.

## DREDGING AT PENETANGUISHENE.

Dredge 'No. 9' operated here under contract, from June 1 to 16, 1905, and removed 12,000 cubic yards of hardpan, boulders, clay and sand.

Dredge 'No. 4' also worked at this place from May 8 to June 24, 1905, removing 24,142 cubic yards of gravel.

## DREDGING AT PETERBORO (OTONABEE RIVER).

The dredge plant used for this work was borrowed from the Department of Railways and Canals. It was necessary to dismantle part of the dredge, in order to bring her up beneath the fixed bridges on Hunter street and that of the Canadian Pacific railway. Work was commenced immediately above the Hunter street bridge, on the west side of the river. A channel 35 feet wide and varying in depth from 8 feet at the lower end to 6 feet at the upper end. This channel was carried from the Hunter street bridge to the entrance of the tail race, from the American Cereal Company's power house, a distance of about 600 feet. A great part of this excavation was a very tough hardpan, which had to be blown at several places in order to loosen it up. The entrance to the American Company's tail race was also excavated for a distance of 286 feet, and a width of 60 feet and a depth of about 7 feet. All this material was hardpan and rock, all of which had to be blown before it could be handled with the dredge. All the material from these two cuts was cast on the side.

As there was no more room to dispose of the excavated material on the west side, the dredge was taken across the river to the east side. In crossing over a channel had to be dredged in order to float the dredge over. A channel was excavated on the east side for a distance of 900 feet, and a width of 35 feet and a depth of 6 to 8 feet. The material at the north end was cast on the side of the river and taken away with

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horses and scrapers. It was not possible to cast on the side of the river from about half way down on the east side, so a track and dump cars were used to take the excavated material away. This material was drawn up on an incline by means of a hoisting engine and dumped on the land of the American Cereal Company. The quantity of material dredged up to June 30 last, was 17,600 cubic yards.

## DREDGING AT PICKERING.

Dredge 'Sir Richard' worked at this place between June 8th and 30th, 1905, the close of the fiscal year. Two cuts were made between the piers; 750 feet long each, 25 feet wide and 12 feet deep at low water. Two other cuts were made at entrance to pier: 50 feet long each, 25 feet wide and 12 feet deep at low water.

12,500 cubic yards of hardpan, clay and sand were removed.

## DREDGING AT POINT EDWARD.

Point Edward is situated at the head of the St. Clair river, in the County of Lambton, adjoining the town of Sarnia, 61 miles west of London. It is a port of call for the Northern Navigation Company's steamers, and for many of the large craft plying on the upper lakes. A large quantity of grain and general merchandise is brought in and shipped by the Grand Trunk railway from this point, also a quantity of ore and steel rails are handled here. It is therefore important to have sufficient depth of water, along the dock front, to permit the entrance of these deep draft vessels.

Authority was given on April 25th, 1904, and, on June 24th, 1904, to dredge the approach to the Grand Trunk elevator dock. This work was performed by the Sarnia Bay Salvage and Towing Co., at the rate of \$15 per hour, and the expenditure amounted to \$6,377.44. This work was performed during the months of October and November, 1904.

On May 18th, 1905, further authority was given for the dredging of a channel, 150 feet wide, to a depth of 21 feet below low water level, from the existing deep water, which was 900 feet south of the Grand Trunk Railway Company's dock, to a point about 400 feet north of the Grand Trunk Railway freight sheds, to provide sufficient water for the larger boats to approach these docks in safety.

The above work was performed by the Sarnia Bay Lumber, Timber and Salt Co., operations were commenced on May 23, 1905, and up to June 30, 1905, 23,870 cubic yards of sand were removed.

The total expenditure at this point during the fiscal year 1904-05 was \$24,201.29.

## DREDGING AT PORT ARTHUR.

The bar in entrance channel has been removed, and there is at present sufficient depth of water for all vessels coming to the port.

During the past winter soundings were taken in the harbour over the dredged areas; and soundings and borings in the proposed channels to Neebing and McIntyre rivers.

Dredging was commenced May 28th, to make a channel to site of proposed Canadian Northern Railway's coal and ore dock and smelter works, and up to June 30th, 53,551 cubic yards were removed. Since that date dredging there has been abandoned owing to change in site of coal and ore docks.

The total amount of material removed during the past fiscal year was 521,368 cubic yards.

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## DREDGING AT PORT BRUCE.

The dredge 'Ottawa' worked here under contract from June 5th to 16th, 1905, deepening the harbour.

Removed 4,133 yards of boulders, gravel, clay and sand.

## DREDGING AT PORT BURWELL.

Dredging operations were performed at this place between June 8th and 30th, 1905, by dredge 'No. 2' under contract.

Removed 18,990 cubic yards of fine sand.

## DREDGING AT PORT ELGIN.

Port Elgin, in the County of Bruce, is situated on the shore of Lake Huron, five miles southerly from Southampton and twenty-six miles northerly from Kincardine, on the Wellington, Grey and Bruce division of the Grand Trunk Railway.

At the last session of parliament, the sum of \$2,000 was appropriated for dredging in the inner basin at this point; the work was performed by the Marlton Dredging Company, of Goderich, from July 2 to August 1, inclusively. The plant worked 249½ hours at \$8 per hour, and removed 18,390 cubic yards of clay and sand.

## DREDGING AT PORT HOPE.

Between May 15 and June 5, 1904, the dredge 'Sir Richard' worked at this place. Three cuts were made between the piers at entrance of harbour, through a sand bar; 450, 350 and 300 feet long, 25 feet wide and 12 feet deep at low water. Two cuts were also made in the new harbour on the approach and in front of Clark's coal sheds; 250 and 150 feet long, 25 feet wide and 12 feet deep at low water.

The material removed was 6,550 cubic yards of hard-pan, clay and sand.

## DREDGING AT PORT PERRY.

Port Perry, a town of 1,000 inhabitants, is situated on the western shore of Lake Scugog, in the County of Ontario, and on the Whitby and Port Perry branch of the Grand Trunk railway.

At the last session of parliament, the sum of \$3,200 was appropriated for dredging at this place, and authority was given on July 22, to expend the amount.

Work was started on September 15, and was completed October 27, and consisted in the removal of some 11,000 cubic yards of material in front of the town and railway wharfs and was performed by one of the government dredges, belonging to the Department of Railways and Canals.

Total expenditure for fiscal year 1904-05 :—

Wages (including crews employed on dredge, tug, scow)	
and superintendence. . . . .	\$ 552 63
Sustenance of crews, towage, fuel, &c. . . . .	811 83
	<hr/>
	\$1,364 46

## DREDGING AT PORT STANLEY.

Between October 6 and November 30, 1904, the close of navigation, the dredge 'Meade' (leased), worked at this place. Five cuts were made, 700, 400, 300 and two 250 feet long, all to a width of 35 feet, inside the piers in the harbour. Two cuts were also made outside of pier, 400 and 550 feet long and 30 feet wide. One other cut was

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made in the slip, 200 feet long and 25 feet wide. All these cuts were made to a depth of 18 feet at low water.

The quantity of material removed was 36,400 cubic yards of clay and sand.

This same dredge continued the work at this place from April 10 to June 30, 1905, the end of the fiscal year. Six cuts were made, 203, 500, 2,645, 2,645, 115 and 325 feet long, all to a width of 25 feet and a depth of from 15 to 20 feet at low water. The work was done alongside the west and east piers and near the lighthouse.

89,476 cubic yards of boulders, gravel, clay and sand were removed.

## DREDGING AT RONDEAU.

The dredge 'Ontario' worked at this place from July 1 to November 30, 1904, the close of navigation. Three cuts were made through the bar outside the piers, 75, 750 and 325 feet long, 25 feet wide and 17 feet deep at low water. This work being completed gives a clear entrance to the harbour 200 feet wide. Five cuts were made inside the harbour, at north end of piers, 375, 375, 430, 450 and 490 feet long, 25 feet wide and 17 feet deep at low water. One cut was also made 115 feet long, 20 feet wide and 14 feet deep at low water, removing crib at east side of east pier. Two other cuts were also made in slip of Père Marquette railway, in front of their new coal dock; first cut, 716 feet long and 25 feet wide; second cut, 365 feet long, 20 feet wide; both cuts were made to a depth of 22 feet at low water. The material removed at this place was 46,370 cubic yards of sand and stone.

Work was also performed at this place by the dredge 'Ontario' from June 13 to 30, 1905, the close of the fiscal year. Two cuts were made in front of Lake Erie Coal Company's wharf, 500 and 400 feet long, 24 feet wide and to a depth of 17 feet at low water. The material removed was 4,680 cubic yards of sand.

Dredge 'Ottawa' worked at this place under contract, from June 20 to 30, removing 11,850 cubic yards of boulders, gravel, clay and sand.

## DREDGING AT SARNIA.

The dredge 'E. Hall No. 1' (leased) worked at this place between June 19 and 29, 1905, the close of the fiscal year. Two cuts were made alongside the elevator, 350 and 450 feet long, 25 feet wide and 21 feet deep at low water.

The quantity of material removed was 9,520 cubic yards of clay and sand.

## DREDGING IN SAUGEEN RIVER.

Dredging operations were performed at this place between June 1 to 30, 1905, by dredge 'No. 15,' under contract, deepening between the piers and in the harbour. 28,507 cubic yards of hardpan, clay and boulders were removed.

## DREDGING IN TRENT RIVER.

Between May 25 to 31, 1905, the dredge 'Trenton' worked at this place, making one cut 1,702 feet long, 30 feet wide and 10 feet deep at low water.

6,650 cubic yards of boulders, clay and mud were removed.

## DREDGING AT TRENTON.

The dredge 'Trenton' (leased), worked at this place from July 1 to August 4, 1904, making a channel through a mud and stone shoal opposite the mouth of the River Trent. One cut was made 1,510 feet long, 30 feet wide and to a depth of 10 feet at low water. 37,525 cubic yards of mud and stones were removed.



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This dredge continued work at this place between June 1 and 30, 1905, the end of the fiscal year, completing the work done the previous season. One cut was made 2,751 feet long, 30 feet wide and 12 feet deep at low water. 20,235 cubic yards of boulders, clay and mud were removed.

DREDGING AT WAUBAUSHENE AND FESSERTON.

Waubauskene and Fesserton are situated at the southern end of Georgian bay. Authority was given on October 19 last to expend the sum of \$1,200 on improvements to steamer channel between these places.

Dredging was commenced by the Penetanguishene dredging plant on October 24, and ceased for the winter on November 10. The dredge worked 163 hours, removing 4,484 cubic yards.

Total expenditure for fiscal year 1904-05:

Dredging. . . . .	\$ 1,304 00
Inspection. . . . .	57 85
	<hr/>
	\$ 1,361 85

DREDGING AT WIARTON.

Dredging at this place was performed by the dredge 'Frank' under contract on June 29 and 30, 1905.

The material removed consisted of 1,400 cubic yards of clay and sand.

DREDGING AT WHITBY.

Work was performed at this place by the dredge 'Trenton' (leased), from August 17 to November 14, 1904, the close of navigation. Work was done between the east and west piers alongside the north pier, and in the slip along the front of the elevator. Ten cuts were made: four 1,650, one 1,550, one 1,400, one 875, one 800 and two 300 feet long. All these cuts were made to a width of 30 feet and to a depth of 16 feet at low water.

101,270 cubic yards of clay and sand were removed.

DREDGING AT WOLFE ISLAND.

Operations were performed by the dredge 'Sir Richard' at this place from July 5 to September 10, 1904, making 12 cuts in front of the ferry dock, 240, 250, 260, 270, 280, 290, 300, 310, 500, 500, 150 and 150 feet long, 25 feet wide and to a depth of 10 feet at low water. The material removed consisted of 31,300 cubic yards of hardpan and clay.

## SESSIONAL PAPER No. 19

STATEMENT OF Expenditure and quantities of material removed by the different Dredges, at different localities, in Ontario and Quebec, during the fiscal year ended June 30, 1905.

Dredge.	Location.	Yards removed.	Character of soil.	Expenditure.	Cost per yard.
Challenge .....	Ottawa River .....	7,940	Hardpan, boulders and sand.	\$ 5,798 59 cts.	cts. 32 <sup>4</sup> / <sub>5</sub>
Ontario .....	Rondeau .....	51,050	Sand, clay and stone .....	10,858 76	21 <sup>1</sup> / <sub>4</sub>
Nipissing .....	Hamilton .....	48,862	Hardpan, boulders, clay, sand and fine sand .....	9,248 57	11 <sup>1</sup> / <sub>5</sub>
" .....	Bronte .....	15,262			
" .....	Kingston .....	19,240			
Queen .....	Ville Marie .....	2,625	Sand, clay and stone .....	10,458 68	32 <sup>7</sup> / <sub>10</sub>
" .....	New Liskeard .....	29,160			
" .....	Haileybury .....	285			
Sir Richard .....	Wolfe Island .....	31,300	Hardpan, clay and sand .....	7,582 67	9 <sup>3</sup> / <sub>10</sub>
" .....	Kingston .....	25,900			
" .....	Port Hope .....	6,950			
" .....	Pickering .....	12,500			
Richelieu .....	Barbotté River .....	3,200	Hardpan, boulders, clay and sand .....	5,209 09	15 <sup>2</sup> / <sub>5</sub>
" .....	Ile-aux-Noix .....	7,150			
" .....	St. Antoine .....	6,300			
" .....	Beloeil .....	570			
" .....	St. Denis .....	6,900			
" .....	St. Charles .....	2,620			
" .....	Lacolle .....	2,300			
" .....	St. Johns .....	2,712			
" .....	Chambly .....	950			
St. Louis .....	St. Aime .....	12,015	Clay, sand and fine sand .....	3,509 98	12 <sup>1</sup> / <sub>5</sub>
" .....	Yamaska .....	8,458			
" .....	Sorel .....	810			
" .....	Ile-du-Pas .....	3,947			
" .....	Pierreville .....	3,540			
Nithsdale .....	St. Jean des Chaillons .....	6,650	Clay, stone and sand .....	11,030 15	53 <sup>1</sup> / <sub>10</sub>
" .....	St. Michel .....	9,240			
" .....	Pt. Platon .....	1,750			
" .....	Berthier en Bas .....	3,150			
International .....	Quebec .....	77,300	Hardpan, boulders and sand	14,670 71	11 <sup>1</sup> / <sub>5</sub>
" .....	Penticost .....	48,000			
" .....	Chicoutimi .....	1,500			
No. 6 .....	Quebec .....	21,120	Boulders and sand .....	4,874 08	23 <sup>1</sup> / <sub>10</sub>
Progress .....	Sorel .....	240	Clay, stone and sand .....	9,488 60	18 <sup>2</sup> / <sub>5</sub>
" .....	River Ouelle .....	16,000			
" .....	Murray Bay .....	15,300			
" .....	Quebec .....	18,720			

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STATEMENT of Expenditure and quantities of materials, &c.—*Continued.*

Dredge.	Location.	Yards Removed.	Character of Soil.	Expendi- ture.	Cost per yard.
				8 cts.	cts.
T. F. M. No. 1....	Calumet.....	9,400	Boulders, clay, sand and sawdust.....	12,696 10	20 $\frac{3}{4}$
" .....	Grenville.....	15,750			
" .....	Cumberland.....	1,150			
" .....	Blanche Shoals.....	34,450			
Little Giant.....	Hawkesbury.....	28,095	Hardpan, boulders and sand }	15,847 65	44 $\frac{1}{2}$
" .....	St. Andrews.....	7,560			
No. 4 Daly.....	L'Assomption.....	62,680	Gravel, clay, stone and mud.	9,390 00	15
Otto.....	River Jesus.....	31,565	Hardpan, boulders, gravel, clay, sand and stone.....	6,557 37	16 $\frac{3}{8}$
" .....	Terrebonne.....	5,800			
" .....	Charlemagne.....	2,000			
No. 7 Coghill.....	Collingwood.....	34,857	Clay, boulders and stone ....	7,785 00	22 $\frac{1}{2}$
No. 4 Cohen.....	Rigaud.....	35,652	Hardpan, boulders, clay and sand ..	10,589 80	27 $\frac{3}{4}$
" .....	Como.....	2,496			
Trenton.....	Trenton.....	57,760	Boulders, clay, sand and mud .....	26,845 68	16 $\frac{1}{10}$
" .....	Whitby.....	101,270			
" .....	Trent River.....	6,050			
Central City.....	Chateauguay.....	16,320	Hardpan, boulders and clay }	8,082 00	28
" .....	Beauharnois.....	12,560			
General Meade....	Port Stanley.....	125,876	Boulders, gravel, clay and sand	21,322 09	16 $\frac{2}{3}$
St. Lawrence.....	Cobourg.....	18,360	Clay, sand and fine sand .. }	4,770 50	17 $\frac{3}{10}$
" .....	Yamaska.....	9,600			
Ottawa.....	Rondeau.....	11,850	Boulders, gravel, clay and sand.....	2,877 05	18
" .....	Port Bruce.....	4,133			
Frank.....	Owen Sound.....	34,965	Clay and sand .....	5,615 95	15 $\frac{1}{2}$
" .....	Warton.....	4,400			
Chateauguay.....	Rigaud.....	11,060	Boulders, clay and gravel....	3,587 00	32 $\frac{3}{8}$
E. Hall No. 1.....	Point Edward.....	23,879	Clay and sand .....	6,965 30	26 $\frac{3}{8}$
" .....	Sarnia.....	9,520			

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STATEMENT of Expenditure and quantities of materials, &c.—*Continued.*

Dredge.	Location.	Yards Removed.	Character of Soil.	Expendi- ture.	Cost per yard.
				\$ cts.	cts.
Pontiac. ....	Ratiscan River. ....	4,080	Clay, stone and sand. .... }	3,238 56	14
" .....	Doucet's Landing. ....	19,043			
No. 6 McDonald ..	River du Loup. ....	33,300	Clay, sand and logs. ....	4,257 90	12 $\frac{1}{2}$
No. 5 McDonald ..	Doucet's Landing. ....	23,501	Boulders, clay and sand . . }	2,664 11	9 $\frac{3}{16}$
" .....	Three Rivers. ....	120			
No. 5 Bowman ....	Port Arthur .....	110,667	Clay, sand and mud. ....	15,619 38	14 $\frac{1}{16}$
No. 6 Bowman ....	Port Arthur .....	28,657	Quick sand, clay and mud. }	18,066 04	22 $\frac{1}{2}$
" .....	Neebing River. ....	50,514			
No. 9 O. S. D. & Cons. Co. ....	Midland. ....	7,800	Hardpan, boulders, clay }	4,661 00	23 $\frac{1}{4}$
" .....	Penetang. ....	12,000			
No. 1 Boone .....	Collingwood .....	3,576	Rock, gravel, mud and slabs.	1,126 45	31 $\frac{1}{2}$
No. 4 O. S. D. & Cons. Co. ....	Penetang. ....	21,142	Gravel. ....	4,265 89	17 $\frac{3}{8}$
Duke of York ....	St. Maurice River. ....	47,646	Clay, stone and sand. ....	6,472 87	13 $\frac{1}{3}$
Quebec. ....	L'Assomption .....	14,710	Clay. ....	2,093 19	14 $\frac{1}{10}$
No. 4 G. Cons. Co.	Graham .....	18,550	Clay. ....	2,448 60	13 $\frac{1}{3}$
No. 2 D. D. & C. Co	Port Burwell. ....	18,990	Fine sand. ....	5,776 00	30 $\frac{3}{4}$
Arnoldi .....	Goderich .....	10,015	Sand. .... }	2,737 25	25 $\frac{3}{8}$
" .....	Kincardine .....	670			
Hydraulic. ....	Neebing River .....	8,148	Quick sand. ....	2,362 92	29
Kingsford .....	Port Arthur .....	30,041	Clay, sand and fine sand. ....	5,869 02	19 $\frac{1}{2}$
No. 1 A. F. B. ....	Port Arthur .....	40,400	Clay, sand and mud. ....	9,100 00	22 $\frac{1}{2}$

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STATEMENT of Expenditure and quantities of materials, &c.—*Concluded.*

Dredge.	Location.	Yards Removed.	Character of Soil.	Expendi- ture.	Cost per yard.
				\$    cts.	cts.
No. 15 A. F. B ...	Saugeen River .....	26,676	Hardpan, clay, stone and boulders .....	16,083 40	60 $\frac{1}{3}$
No. 14 Boone .....	Collingwood .....	19,170	Rock and mud .....	41,730 91	2.17 $\frac{17}{16}$

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CLASSIFICATION AND DISBURSEMENTS of the Dredges during the Year ended June 30, 1905  
DREDGE CHALLENGE.

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.		
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	
Wages.....	321	46	456	35	290	00	392	50	423	58	87	00	60	00					14	80	212	90	355	00	2,303	79	
Coal.....					334	72			10	24													257	15	602	11	
Provisions.....	130	77			121	80	135	00													31	76			419	83	
Stores.....	21	24	16	25					3	10															57	34	
Equipment.....	9	32			88	23																			203	92	
Repairs.....			250	35	74	72									347	78									481	40	
Towage.....					57	00																			57	00	
Contingencies.....	5	30					9	35	43	70			630	00											14	95	
Totals.....	488	09	703	15	983	22	446	85	480	62	87	00	690	00	347	78			14	80	244	66	1,312	42	5,798	59	
Working expenses.....			452	80	908	50	446	85	480	62	87	00	690	00					14	80	244	66	831	02	4,644	34	
Repairs, ordinary.....			250	35	74	72									347	78									1,154	25	
Totals.....	488	09	703	15	983	22	446	85	480	62	87	00	690	00	347	78			14	80	244	66	1,312	42	5,798	59	
DREDGE - ONTARIO.																											
Wages.....	331	97	401	05	425	00	307	67	513	59			183	87					709	16	457	79	546	18	4,255	39	
Coal.....	221	07			1,171	75	183	00	210	00	297	37											89	95	2,083	14	
Provisions.....	121	45	117	39	123	58	123	58	150	24											113	90	308	72	1,058	68	
Stores.....	43	23			72	36	23	81			11	85	18	12									150	51	468	43	
Equipment.....	10	00			36	30					29	07											143	29	218	66	
Repairs.....	225	12			139	57	10	00			15	98													1,000	34	
Contingencies.....	19	38			5	25	11	60			43	15			43	55									1,391	21	
Totals.....	1,082	22	518	44	1,973	63	659	66	873	83	307	42	201	99	103	55	199	11	709	16	670	24	3,499	51	10,858	76	
Working expenses.....	857	10	518	44	1,834	06	649	66	773	83	291	44	201	99	103	55	199	11	709	16	670	24	2,498	97	9,467	55	
Repairs, ordinary.....	225	12			139	57	10	00			15	98													1,000	34	
Totals.....	1,082	22	518	44	1,973	63	659	66	873	83	307	42	201	99	103	55	199	11	709	16	670	24	3,499	51	10,858	76	

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CLASSIFICATION OF DISBURSEMENTS OF the Dredges during the Year ended 30th June, 1905.  
DREDGE 'NIPISSING.'

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.		
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	
Wages.....	445 00		392 26		410 00		418 73		410 00		150 76		265 00		278 00		382 69		284 17		346 29		504 32		4,246 57		
Coal.....	210 00		118 12		255 05		352 65		132 75		242 20		61 60								29 00		584 75		1,185 63		
Provisions.....	137 00		114 48		123 00		123 00						59 56								100 00		173 06		979 15		
Stores.....	61 50		33 00		74 08		12 25				13 45						14 73				152 29		170 03		555 28		
Equipment.....															14 07		33 00								47 07		
Repairs.....	459 24		9 80				33 28				12 72				79 15		261 52				151 61		18 62		1,025 94		
Pilotage.....											23 90														25 90		
Contingencies.....	28 30		19 10		6 45		8 00				24 00				46 95		6 40				12 60		31 13		183 03		
Totals.....	1,672 89		686 76		868 58		947 92		542 75		469 03		386 16		418 17		638 44		284 17		791 79		1,481 91		9,248 57		
Working expenses.....	1,213 65		676 96		868 58		914 61		542 75		456 31		386 16		339 02		436 92		284 17		640 18		1,463 29		8,222 63		
Repairs, ordinary.....	459 24		9 80				33 28				12 72				79 15		216 52				151 61		18 62		1,025 94		
Totals.....	1,672 89		686 76		868 58		947 92		542 75		469 03		386 16		418 17		638 44		284 17		791 79		1,481 91		9,248 57		
DREDGE 'QUEEN.'																											
Wages.....	445 00		445 00		444 00		456 98		533 75				11 25		372 05		846 25		819 75		730 92		512 00		5,616 45		
Coal.....	210 00				262 50		98 75																375 15		1,460 40		
Provisions.....	137 00		141 19		150 75		135 00		151 80						74 78		197 59		207 00		139 19		135 00		1,469 30		
Stores.....	61 50				68 00		62 43						79 19		7 88								113 18		382 18		
Equipment.....							25 14																	25 14			
Repairs.....	12 15				34 82		262 14		160 34		47 30		55 00		104 35		141 78				275 92		409 16		1,447 96		
Towage.....							108 00																	163 00			
Contingencies.....	60 20		25 00		20 00						51 20		108 34		27 85		44 55						88 01		425 25		
Totals.....	925 85		611 19		980 07		1,148 44		845 39		98 50		253 78		587 01		1,230 17		1,026 75		1,146 03		1,632 50		10,485 68		



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DREDGE 'SIR RICHARD.										
Working expenses,...	913 70	611 19	945 25	886 30	685 05	51 20	253 78	482 66	1,088 39	1,026 75
Repairs, ordinary, ...	12 15	.....	34 82	262 14	160 34	47 30	.....	104 35	141 78	.....
Totals, .....	925 85	611 19	980 07	1,148 44	845 39	98 50	253 78	587 01	1,230 17	1,026 75
DREDGE 'RICHELIEU.										
Wages, .....	357 90	410 81	404 41	287 90	375 00	90 00	90 00	90 00	157 26	292 92
Coal, .....	280 20	221 37	136 40	502 00	.....	136 30	.....	.....	.....	.....
Provisions, .....	.....	108 39	94 10	117 19	111 00	.....	20 90	.....	.....	.....
Stores, .....	61 70	19 05	185 00	24 77	.....	9 60	.....	8 15	105 40	47 45
Equipment, .....	12 00	.....	4 65	.....	.....	.....	.....	21 83	63 25	.....
Repairs, .....	77 41	56 38	51 39	75 78	.....	138 80	.....	2 88	384 89	.....
Contingencies, .....	8 30	7 65	80 60	.....	.....	13 35	.....	.....	11 67	.....
Totals, .....	806 51	823 65	956 55	1,005 64	486 00	388 05	110 90	122 86	325 91	292 92
Working expenses,...	729 10	767 27	905 16	931 86	486 00	249 25	110 90	101 03	262 66	292 92
Repairs, ordinary,...	77 41	56 38	51 39	73 78	.....	138 80	.....	21 83	63 25	.....
Totals, .....	806 51	823 65	956 55	1,005 64	486 00	388 05	110 90	122 86	325 91	292 92
DREDGE 'RICHELIEU.										
Wages, .....	385 00	389 35	535 00	385 00	237 00	54 74	20 00	190 26	284 75	228 17
Coal, .....	52 90	8 20	7 05	7 00	5 30	.....	.....	.....	.....	.....
Provisions, .....	158 58	128 54	129 15	123 00	136 40	21 98	21 66	.....	.....	.....
Stores, .....	37 75	6 11	74 54	.....	.....	.....	.....	.....	.....	.....
Equipment, .....	.....	3 66	20 06	5 69	11 40	.....	.....	.....	.....	.....
Repairs, .....	15 21	.....	10 00	.....	3 10	1 88	.....	37 39	178 54	265 47
Towage, .....	.....	.....	13 80	.....	12 00	.....	.....	.....	44 00	.....
Contingencies, .....	.....	.....	.....	.....	13 80	8 00	.....	70 00	.....	.....
Totals, .....	655 44	535 80	649 00	530 69	419 00	86 60	41 66	260 26	284 75	228 17
Working expenses,...	640 23	532 20	629 54	525 00	415 90	84 72	41 66	260 26	284 75	228 17
Repairs, ordinary, ...	15 21	3 60	20 06	5 69	3 10	1 88	.....	.....	.....	.....
Totals, .....	655 44	535 80	649 00	530 69	419 00	86 60	41 66	260 26	284 75	228 17

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## CLASSIFICATION OF DISBURSEMENTS of the Dredge during the Year ended 30th June, 1905.

## DREDGE 'ST. LOUIS.'

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.	
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.
Wages.....	370 00		376 00		369 00		374 50		405 65												392 33		374 43		2,662 11	
Provisions.....	103 00		120 00		122 60		123 00		123 00												119 13		123 00		833 73	
Stores.....	1 25																								1 25	
Equipment.....			1 25																						1 25	
Repairs.....					4 89																				4 89	
Contingencies.....					1 35																				1 35	
Totals.....	474 25		497 25		497 84		497 50		528 65				3 75								511 46		499 28		3,509 98	
Working expenses.....	474 25		497 25		492 95		497 50		528 65				3 75								511 46		499 28		3,505 09	
Repairs, ordinary.....					4 89																				4 89	
Totals.....	474 25		497 25		497 84		497 50		528 65				3 75								511 46		499 28		3,509 98	

## DREDGE 'NITHSDALE.'

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.	
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.
Wages.....	405 00		405 00		205 00		398 54		229 50														316 64		1,959 68	
Coal.....					284 75		207 95		4 25														252 36		749 31	
Provisions.....	110 00		110 00		110 00		108 71		74 80														111 37		624 88	
Stores.....			6 60				9 93		1 60														33 38		51 51	
Repairs.....							13 65																49 12		62 77	
Contingencies.....	1,240 00		1,240 00		1,200 00		680 00																1,990 00		7,590 00	
Totals.....	1,755 00		1,761 60		1,799 75		1,978 78		990 15														3,752 87		11,038 15	
Working expenses.....	1,755 00		1,761 60		1,799 75		1,965 13		990 15														2,703 75		10,975 38	
Repairs, ordinary.....							13 65																49 12		62 77	
Totals.....	1,755 00		1,761 60		1,799 75		1,978 78		990 15														2,752 87		11,038 15	

## SESSIONAL PAPER No. 19

## DREDGE 'INTERNATIONAL.

19 Wages.....	1,078 23					252 05	300 96		708 67	831 03	1,170 91	4,341 85
17 Coal.....	661 91	440 28									362 19	1,464 38
17 Provisions.....											454 38	698 32
17 Stores.....											330 33	433 90
17 Equipment.....											69 00	91 05
18 Repairs.....											120 93	544 43
18 Towage.....											1,383 73	5,383 73
18 Contingencies.....											400 00	1,738 05
Totals.....	3,078 19	440 28	1,855 79	1,811 50	67 51	253 87	323 96		810 92	1,074 97	4,491 47	14,670 71
Working expenses.....	3,078 19	440 28	1,750 00	1,811 50	3 67	462 25	323 96		810 92	1,074 97	4,370 54	14,126 28
Repairs, ordinary.....			105 79		43 84	253 87					120 93	544 43
Totals.....	3,078 19	440 28	1,855 79	1,811 50	67 51	253 87	323 96		810 92	1,074 97	4,491 47	14,670 71

## DREDGE No. 6, 'D. P. W.

Wages.....									66 29	230 84	285 00	402 50	984 63
Coal.....												110 90	110 90
Provisions.....												237 00	237 00
Stores.....												137 06	137 06
Repairs.....												217 31	217 31
Towage.....												2,680 12	2,677 86
Contingencies.....												44 00	44 00
Totals.....									66 29	244 84	393 62	4,071 58	4,874 07
Working expenses.....									66 29	244 84	393 62	1,391 46	2,096 21
Repairs, ordinary.....												2,680 12	2,777 86
Totals.....									66 29	244 84	393 62	4,071 58	4,874 07



## SESSIONAL PAPER No. 19

## DREDGE 'LITTLE GIANT.'

Wages.....	65 00	68 00	78 00	78 00	36 00	.....	.....	.....	.....	62 50	387 50
Towage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	280 00
Contingencies...	2,376 00	2,608 00	2,368 00	2,002 20	864 00	.....	.....	.....	.....	4,951 95	15,170 15
Totals.....	2,441 00	2,676 00	2,446 00	2,080 20	1,180 00	.....	.....	.....	.....	5,014 45	15,837 65
Working expenses...	2,441 00	2,676 00	2,446 00	2,080 20	1,180 00	.....	.....	.....	.....	5,014 45	15,837 65
Totals.....	2,441 00	2,676 00	2,446 00	2,080 20	1,180 00	.....	.....	.....	.....	5,014 45	15,837 65

## DREDGE No. 4 'DALY.'

Wages.....	78 00	81 00	78 00	78 00	39 00	.....	.....	.....	.....	.....	354 00
Contingencies.....	2,016 00	2,136 00	2,080 00	1,764 00	1,040 00	.....	.....	.....	.....	.....	9,036 00
Totals.....	2,094 00	2,217 00	2,158 00	1,842 00	1,079 00	.....	.....	.....	.....	.....	9,390 00
Working expenses...	2,094 00	2,217 00	2,158 00	1,842 00	1,079 00	.....	.....	.....	.....	.....	9,390 00
Totals.....	2,094 00	2,217 00	2,158 00	1,842 00	1,079 00	.....	.....	.....	.....	.....	9,390 00

## DREDGE 'OTTO.'

Wages.....	276 50	81 00	92 37	78 00	.....	.....	.....	.....	.....	.....	527 87
Contingencies.....	1,675 00	1,308 00	1,086 00	1,393 00	567 50	.....	.....	.....	.....	.....	6,029 50
Totals.....	1,951 50	1,389 00	1,178 37	1,471 00	567 50	.....	.....	.....	.....	.....	6,557 37
Working expenses...	1,951 50	1,389 00	1,178 37	1,471 00	567 50	.....	.....	.....	.....	.....	6,557 37
Totals.....	1,951 50	1,389 00	1,178 37	1,471 00	567 50	.....	.....	.....	.....	.....	6,557 37



## SESSIONAL PAPER No. 19

## DREDGE 'TRENTON.'

Wages .....	90 00	57 00	78 00	78 00	67 50	.....	.....	.....	45 00	51 00	465 50
Equipment .....	5 00	5 00	.....	.....	.....	.....	.....	.....	.....	.....	10 00
Towage .....	.....	.....	808 00	.....	320 00	.....	.....	.....	.....	.....	1,128 00
Contingencies .....	4,180 00	2,938 66	4,572 67	4,534 67	2,606 00	.....	.....	.....	1,197 00	5,212 18	25,241 18
Totals .....	4,275 00	3,000 66	5,458 67	4,612 67	2,993 50	.....	.....	.....	1,242 00	5,263 18	26,845 68
Working expenses .....	4,275 00	3,000 66	5,458 67	4,612 67	2,993 50	.....	.....	.....	1,242 00	5,263 18	26,845 68
Totals .....	4,275 00	3,000 66	5,458 67	4,612 67	2,993 50	.....	.....	.....	1,242 00	5,263 18	26,845 68

## DREDGE 'CENTRAL CITY.'

Wages .....	78 00	81 00	78 00	78 00	39 00	.....	.....	.....	.....	.....	354 00
Contingencies .....	1,920 00	2,016 00	1,600 00	1,544 00	648 00	.....	.....	.....	.....	.....	7,728 00
Totals .....	1,998 00	2,097 00	1,678 00	1,622 00	687 00	.....	.....	.....	.....	.....	8,082 00
Working expenses .....	1,998 00	2,097 00	1,678 00	1,622 00	687 00	.....	.....	.....	.....	.....	8,082 00
Totals .....	1,998 00	2,097 00	1,678 00	1,622 00	687 00	.....	.....	.....	.....	.....	8,082 00

## DREDGE 'GENERAL MEADE.'

Wages .....	87 00	91 80	87 00	.....	.....	.....	.....	.....	55 00	67 50	78 57
Contingencies .....	2,376 00	3,372 00	2,376 00	.....	.....	.....	.....	.....	3,624 44	5,083 18	6,486 60
Totals .....	2,463 00	3,463 80	2,463 00	.....	.....	.....	.....	.....	3,679 44	5,150 68	6,565 17
Working expenses .....	2,463 00	3,463 80	2,463 00	.....	.....	.....	.....	.....	3,679 44	5,150 68	6,565 17
Totals .....	2,463 00	3,463 80	2,463 00	.....	.....	.....	.....	.....	3,679 44	5,150 68	6,565 17



5-6 EDWARD VII., A. 1906

CLASSIFICATION OF DISBURSEMENTS of the Dredges during the Year ended June 30, 1905—Continued.  
DREDGE 'ST. LAWRENCE.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages, . . . . .	67 50	.....	.....	67 50	55 00	.....	.....	.....	.....	.....	.....	38 00	100 50
Contingencies, . . . . .	1,520 06	.....	.....	1,520 06	1,170 00	.....	.....	.....	.....	.....	.....	1,920 00	4,610 00
Totals, . . . . .	1,587 50	.....	.....	1,587 50	1,225 00	.....	.....	.....	.....	.....	.....	1,958 00	4,770 50
Working expenses, . . . . .	1,587 50	.....	.....	1,587 50	1,225 00	.....	.....	.....	.....	.....	.....	1,958 00	4,770 50
Totals . . . . .	1,587 50	.....	.....	1,587 50	1,225 00	.....	.....	.....	.....	.....	.....	1,958 00	4,770 50

## DREDGE 'OTTAWA.'

Wages, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30 00	30 00
Contingencies, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,847 05	2,847 05
Totals, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,877 05	2,877 05
Working expenses, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,877 05	2,877 05
Totals, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,877 05	2,877 05

## DREDGE 'A. F. BOWMAN.'

Wages, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36 00	78 00	114 00
Contingencies, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,737 02	3,764 93	5,501 95
Totals, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,773 02	3,842 93	5,615 95

## SESSIONAL PAPER No. 19

Working expenses.....	1,773 02	2,842 43	5,615 95
Totals.....	1,773 02	3,842 43	5,615 95

## DREDGE 'CHATEAUGUAY,'

Wages.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...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## DREDGE 'E. HALL' No. 1.

	11 50	78 00	95 50
Wages.....	684 40	6,205 40	6,869 80
Contingencies.....			
Totals.....	684 40	6,205 40	6,869 80
Working expenses.....	681 90	6,283 40	6,965 30
Totals.....	681 90	6,283 40	6,965 30

## DREIDGE PONTIAC 'W. J. POUPORE,'

Wages, . . . . .	75 00	12 50	87 50
Contingencies, . . . . .	2,339 06	612 00	3,151 06
Totals . . . . .	2,414 06	624 50	3,235 56
Working expenses, . . . . .	2,414 06	624 50	3,235 56
Totals . . . . .	2,414 06	624 50	3,235 56

5-6 EDWARD VII., A. 1906

## CLASSIFICATION OF DISBURSEMENTS OF the Dredges during the Year ended June 30, 1905—Continued.

## DREDGE 'No. 6,' R. McDONALD.

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....											9 00	75 00	87 00
Contingencies.....												4,170 90	4,170 90
Totals.....											9 00	4,248 90	4,257 90
Working expenses.....											9 00	4,248 90	4,257 90
Totals.....											9 00	4,248 90	4,257 90

## DREDGE 'No. 5,' R. McDONALD.

Wages.....												75 00	75 00
Contingencies.....												2,589 11	2,589 11
Totals.....												2,664 11	2,664 11
Working expenses.....												2,664 11	2,664 11
Totals.....												2,664 11	2,664 11

## DREDGE 'No. 5,' A. F. BOWMAN.

Wages.....											51 00	75 00	126 00
Contingencies.....											4,830 70	10,462 68	15,493 38
Totals.....											4,881 70	10,737 68	15,619 38
Working expenses.....											4,881 70	10,737 68	15,619 38
Totals.....											4,881 70	10,737 68	15,619 38

## SESSIONAL PAPER No. 19

## DREDGE 'No. 6,' A. F. BOWMAN.

Wages.....	.....	.....	.....	.....	.....	.....	.....	93 65	78 00	171 65
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	5,258 63	12,635 76	17,894 39
Totals.....	.....	.....	.....	.....	.....	.....	.....	5,352 28	12,713 76	18,066 04
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	5,352 28	12,713 76	18,066 04
Totals.....	.....	.....	.....	.....	.....	.....	.....	5,352 28	12,713 76	18,066 04

## DREDGE 'No. 9,' O. S. DREDGE AND CONSTRUCTION COMPANY.

Wages.....	.....	.....	.....	.....	.....	.....	.....	12 00	78 00	90 00
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	4,571 00	4,571 00
Totals.....	.....	.....	.....	.....	.....	.....	.....	12 00	4,649 00	4,661 00
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	12 00	4,649 00	4,661 00
Totals.....	.....	.....	.....	.....	.....	.....	.....	12 00	4,649 00	4,661 00

## DREDGE 'No. 1,' C. S. BOONE.

Wages.....	.....	.....	.....	.....	.....	.....	.....	.....	18 00	18 00
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	1,108 45	1,108 45
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	1,126 45	1,126 45
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	.....	1,126 45	1,126 45
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	1,126 45	1,126 45

## DREDGE 'No. 4,' O. S. DREDGE AND CONSTRUCTION COMPANY.

Wages.....	.....	.....	.....	.....	.....	.....	.....	63 65	77 10	140 75
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	1,935 30	2,189 84	4,125 14
Totals.....	.....	.....	.....	.....	.....	.....	.....	1,998 95	2,266 94	4,265 89
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	1,998 95	2,266 94	4,265 89
Totals.....	.....	.....	.....	.....	.....	.....	.....	1,998 95	2,266 94	4,265 89

5-6 EDWARD VII., A. 1906

CLASSIFICATION of Disbursements of the Dredges during the Year ended 30th June, 1905—*Continued.*  
DREDGE 'DUKE OF YORK'.

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£
Wages.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63 00	45 75	108 75
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,406 25	3,957 87	6,364 12
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,469 25	4,003 62	6,472 87
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,469 25	4,003 62	6,472 87
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,469 25	4,003 62	6,472 87
DREDGE 'QUEBEC' GENERAL CONSTRUCTION COMPANY.													
Wages.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86 75	86 75
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,006 44	2,006 44
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,093 19	2,093 19
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,093 19	2,093 19
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,093 19	2,093 19
DREDGE 'No. 4' GENERAL CONSTRUCTION COMPANY.													
Wages.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 50	57 50
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,391 10	2,391 10
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,448 60	2,448 60
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,448 60	2,448 60
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,448 60	2,448 60

## SESSIONAL PAPER No. 19

## DREDGE 'No. 2,' DOMINION DREDGE AND CONSTRUCTION COMPANY.

Wages.....	.....	.....	.....	.....	.....	.....	.....	69 00	69 00
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	5,697 00	5,697 00
Totals.....	.....	.....	.....	.....	.....	.....	.....	5,766 00	5,766 00
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	5,766 00	5,766 00
Totals.....	.....	.....	.....	.....	.....	.....	.....	5,766 00	5,766 00

## DREDGE 'ARNOLD,' MARLTON DREDGE COMPANY.

Wages.....	.....	.....	.....	.....	.....	.....	.....	66 00	66 00
Contingencies.....	.....	.....	.....	.....	.....	.....	.....	2,671 25	2,671 25
Totals.....	.....	.....	.....	.....	.....	.....	.....	2,737 25	2,737 25
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	2,737 25	2,737 25
Totals.....	.....	.....	.....	.....	.....	.....	.....	2,737 25	2,737 25

## DREDGE 'HYDRAULIC No. 3,'

Contingencies.....	.....	.....	.....	.....	.....	.....	.....	2,362 92	2,362 92
Totals.....	.....	.....	.....	.....	.....	.....	.....	2,362 92	2,362 92
Working expenses.....	.....	.....	.....	.....	.....	.....	.....	2,362 92	2,362 92
Totals.....	.....	.....	.....	.....	.....	.....	.....	2,362 92	2,362 92

## DREDGE 'KINGSFORD,' A. F. BOWMAN.

Wages.....	.....	.....	.....	.....	.....	.....	75 00	78 00	153 00
Contingencies.....	.....	.....	.....	.....	.....	.....	3,036 00	2,680 02	5,716 02
Totals.....	.....	.....	.....	.....	.....	.....	3,111 00	2,758 02	5,869 02
Working expenses.....	.....	.....	.....	.....	.....	.....	3,111 00	2,758 02	5,869 02
Totals.....	.....	.....	.....	.....	.....	.....	3,111 00	2,758 02	5,869 02







CLASSIFICATION AND QUANTITIES OF Material removed by Dredges during the Year ended June 30, 1905—Continued.

DREDGE 'QUEEN.'

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Stone .....	5,425	7,220	3,500	6,265	1,955						75	10	85
Clay .....												7,420	31,785
Sand, ordinary .....											100	100	200
Totals .....	5,425	7,220	3,500	6,265	1,955						175	7,530	32,970

DREDGE 'SIR RICHARD.'

Hard-pan .....			1,300	2,500	8,000								11,800
Clay .....	10,700	15,500	10,000	8,300	900								45,400
Sand, ordinary .....											5,650	13,800	19,450
Totals .....	10,700	15,500	11,300	10,800	8,900						5,650	13,800	76,650

DREDGE 'RICHELIEU.'

Hard-pan .....			500										4,510
Boulders .....		1,000	1,750								950	3,000	3,752
Clay .....	1,600	1,550	1,750	8,870	650						12		15,370
Sand, ordinary .....		4,000	320								950		9,970
Totals .....	6,350	6,550	4,320	8,870	650						1,912	4,050	32,702

## SESSIONAL PAPER No. 19

## DREDGE 'ST. LOUIS.'

Clay.....	.....	517	.....	.....	.....	.....	.....	.....	517
Sand, ordinary.....	5,040	4,581	4,425	1,740	.....	.....	.....	.....	20,766
Sand, very fine.....	.....	.....	.....	.....	.....	.....	.....	.....	7,487
Totals.....	4,980	5,040	4,425	1,740	.....	.....	.....	.....	28,770

## DREDGE 'NITHSDALE.'

Clay.....	.....	600	.....	.....	.....	.....	.....	.....	3,800
Clay and stone.....	600	660	1,270	1,030	.....	.....	.....	.....	5,860
Sand, ordinary.....	1,780	1,925	1,390	1,000	.....	.....	.....	.....	9,380
Mud.....	.....	.....	1,750	.....	.....	.....	.....	.....	1,750
Totals.....	2,380	3,185	4,410	2,240	.....	.....	.....	.....	20,790

## DREDGE 'INTERNATIONAL.'

Hard pan.....	.....	.....	.....	.....	.....	.....	.....	.....	36,150
Boulders.....	8,400	3,250	17,625	3,125	.....	.....	.....	.....	33,350
Gravel.....	.....	3,250	17,625	7,000	12,875	.....	.....	.....	4,100
Sand, ordinary.....	8,400	.....	.....	3,875	12,875	.....	.....	.....	1,900
Totals.....	16,800	6,500	35,250	14,000	25,750	.....	.....	.....	26,900
									126,800

## DREDGE No. 6, 'D.P.W.'

Boulders, stone.....	.....	.....	.....	.....	.....	.....	.....	.....	3,120
Sand, ordinary.....	6,240	.....	.....	4,560	2,240	.....	.....	.....	18,000
Totals.....	6,240	.....	.....	4,560	2,240	.....	.....	.....	21,120



## SESSIONAL PAPER No. 19

DREDGE "No. 4 DALY"									
19	Gravel	2,400	.....	.....	.....	.....	.....	.....	2,400
18	Clay	2,960	.....	.....	.....	.....	.....	.....	11,620
17	Clay and some Mud	9,120	16,680	14,560	5,760	2,900	.....	.....	46,160
16	Mud	.....	.....	.....	5,760	2,900	.....	.....	2,900
15	Totals	14,080	16,680	14,560	11,520	5,800	.....	.....	62,680

## DREDGE &amp; OTTO.

[illegible]

## DREDGE 'No. 7 COGHILL,'

Casting over.....	34,857.
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## DREDGE 'No. 4,' COHEN &amp; SON.

[illegible]

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CLASSIFICATION AND QUANTITIES OF Material removed by Dredges during the Year ended June 30, 1905.  
DREDGE 'TRENTON.'

Description of Material dredged.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	
Hard-pan.																									3,850
Boulders.									855												1,460	2,300			3,655
Clay.									8,078												1,200	1,600			43,948
" and stone.																							9,080		9,080
Sand—ordinary.									17,335																51,322
Mud.	31,350		8,525	5,320			17,295		8,167																47,825
Totals	31,350		22,040		34,010		34,295		17,100												2,660		24,225		165,680

## DREDGE 'CENTRAL CITY.'

Hard-pan.							1,400																		15,040
Boulders.							1,680																		1,680
Clay.							4,880		5,200																12,160
Totals	6,160		4,880		2,560		8,000		5,200																28,880

## DREDGE 'GENERAL MEADE.'

Boulders.																									1,368
Gravel.																									17,624
Clay.																									51,624
Sand—ordinary.																									54,396
Mud.																									864
Totals							14,836		21,504												22,648		39,556		125,876

## SESSIONAL PAPER No. 19

## DREDGE 'ST. LAWRENCE

Clay.....	4,100	4,320	.....	.....	.....	.....	8,420
Sand—ordinary.....	5,620	4,320	.....	.....	.....	.....	9,940
"    very fine.....	.....	.....	.....	.....	.....	.....	9,600
Totals.....	9,720	8,640	.....	.....	.....	.....	27,960

## DREDGE 'OTTAWA, MANLEY &amp; CO.

Boulders.....	.....	.....	.....	.....	.....	.....	700
Gravel.....	.....	.....	.....	.....	.....	.....	700
Clay.....	.....	.....	.....	.....	.....	.....	3,150
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	11,433
Totals.....	.....	.....	.....	.....	.....	.....	15,983

## DREDGE 'FRANK,' A. F. BOWMAN.

Clay.....	.....	.....	.....	.....	.....	7,000	19,630
Sand—ordinary.....	.....	.....	.....	.....	.....	5,825	16,775
Totals.....	.....	.....	.....	.....	.....	12,825	36,365

## DREDGE 'CHATEAUGUAY.'

Boulders and clay.....	.....	.....	.....	.....	.....	.....	5,250
Gravel.....	.....	.....	.....	.....	.....	.....	5,810
Totals.....	.....	.....	.....	.....	.....	.....	11,060

## DREDGE 'E. HALL No. 1.'

Clay.....	.....	.....	.....	.....	.....	.....	9,520
Sand—ordinary.....	.....	.....	.....	.....	.....	6,760	23,870
Totals.....	.....	.....	.....	.....	.....	6,760	33,390



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## CLASSIFICATION AND QUANTITIES OF MATERIAL REMOVED BY DREDGES DURING THE YEAR ENDED 30TH JUNE, 1905—Continued.

## DREDGE 'W. J. POUTORE.'

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Boulders.....	.....	.....	.....	3,043	.....	.....	.....	.....	.....	.....	.....	4,080	3,043
Clay.....	.....	.....	.....	8,000	.....	.....	.....	.....	.....	.....	.....	.....	12,080
Sand—ordinary.....	.....	.....	.....	8,000	.....	.....	.....	.....	.....	.....	.....	.....	8,000
Totals.....	.....	.....	.....	19,043	.....	.....	.....	.....	.....	.....	.....	4,080	23,123

## DREDGE 'No. 6, R. McDONALD.'

Clay.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,300	19,400	20,700
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,300	11,300	12,600
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,600	30,700	33,300

## DREDGE 'No. 5, R. McDONALD.'

Boulders.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42 <sup>3</sup> / <sub>4</sub>	42 <sup>3</sup> / <sub>4</sub>
Clay and stone.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,036 <sup>1</sup> / <sub>2</sub>	19,036 <sup>1</sup> / <sub>2</sub>
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,543	9,543
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,021 <sup>1</sup> / <sub>2</sub>	28,021 <sup>1</sup> / <sub>2</sub>

## SESSIONAL PAPER No. 19

DREDGE 'No. 5, A. F. BOWMAN.'

Clay.....	.....	.....	.....	.....	.....	.....	.....	18,780	37,828	56,617
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	.....	19,170	19,170	19,170
" very fine.....	.....	.....	.....	.....	.....	.....	.....	6,164	6,164	6,164
Mud.....	.....	.....	.....	.....	.....	.....	.....	15,716	13,000	28,716
Totals.....	.....	.....	.....	.....	.....	.....	.....	34,505	76,162	110,667

DREDGE 'No. 6, A. F. BOWMAN.'

Clay.....	.....	.....	.....	.....	.....	.....	.....	9,200	13,422	22,622
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	.....	4,592	4,592	4,592
" very fine.....	.....	.....	.....	.....	.....	.....	.....	14,865	37,092	37,092
Mud.....	.....	.....	.....	.....	.....	.....	.....	28,657	50,514	79,171
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

DREDGE 'No. 9, OWEN SOUND DGE. &amp; CONS. CO.'

Hard pan.....	.....	.....	.....	.....	.....	.....	.....	800	500	1,300
•Boulders.....	.....	.....	.....	.....	.....	.....	.....	800	1,400	2,200
Clay.....	.....	.....	.....	.....	.....	.....	.....	.....	14,900	14,900
Sand—ordinary.....	.....	.....	.....	.....	.....	.....	.....	.....	1,400	1,400
Totals.....	.....	.....	.....	.....	.....	.....	.....	1,600	18,200	19,800

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## CLASSIFICATION AND QUANTITIES OF MATERIAL REMOVED BY DREDGES DURING THE YEAR ENDED 30th JUNE, 1905.

## DREDGE No. 1, C. S. BOONE.

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	(Grand Totals.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Buildings—rock	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	6
Clay—slabs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,156	3,156
Mud—slabs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	414	414
Totals	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,576	3,576

## DREDGE No. 4 OWEN SOUND, DGE. &amp; CONS. CO.

											* 11,340	12,802	24,142
Gravel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

## DREDGE 'DUKE OF YORK'

Clay—blue	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,301	12,301
Clay and Sand	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,084	10,084
Sand—ordinary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17,400	7,861	25,261
Totals	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17,400	30,246	47,646

## DREDGE 'QUEBEC' GENT' CONS. CO.

Clay—blue	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180	14,530	14,710

## DREDGE 'No. 4' GENT' CONS. CO.

Clay	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,550	.....	.....	18,550



## CLASSIFICATION AND QUANTITIES OF MATERIAL REMOVED BY DREDGES DURING THE YEAR ENDED 30TH JUNE, 1905.—Continued.

DREDGE 'No. 14, C. S. BOONE.'

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Builders—rock . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,298	9,642	17,940
Mud . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	513	747	1,260
Totals . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,771	10,389	19,170

## PROVINCE OF MANITOBA.

## DREDGING.

*Delta Harbour.*

The dredge 'Manitoba' started operations dredging a channel at the north side of the Canadian Northern railway siding at Delta. A good deal of difficulty was experienced taking the dredge to the starting point by way of Clandeboye bay and inland creek. It was, however, taken to the inner harbour and work started, a great deal to the satisfaction of the people interested, particularly those at Portage la Prairie.

*Fairford River Canal (Lake Manitoba Outlet).*

The plant doing the work at the mouth of the Mossy river, and also intended to do the Fairford river work, was, owing to the very low water, engaged dredging a channel at the mouth of the Mossy river, but some repairs and maintenance of the plant was charged to the Fairford river work, as well as fuel ordered and paid, for, expecting that the work should be proceeded with, if not with the dredge 'Priestman' with the dredge 'Manitoba' plant. Owing to the lowness of the water, it would appear as if more plant would be required to do all the necessary work.

*Lowering Lake Dauphin.*

The clam shell dredge 'Priestman' equipped for the purpose of lowering Lake Dauphin, was, owing to the low stage of the water, kept working at the mouth of the Mossy river, in order to permit steamers to go in and out of the river. It was the intention to have the dredge work her way up the river removing boulders and other obstacles, but for the reason aforesaid, it was thought advisable to keep the plant working at the mouth of the river, that also partly answers the purpose of the work of lowering Lake Dauphin.

*Mossy River (mouth).*

The barge and clam shell dredge 'Priestman' equipped for the purpose of carrying on the dredging at the mouth of the Mossy river, also the removal of boulders from the bed of the Mossy and Fairford rivers, was completed the first week in August, 1904. An attempt was made to take the plant up to Lake Dauphin by way of the Mossy river, in order to firstly start the work of the regulation of the flow of the said lake, but owing to the very low stage of the water, the plant could only have been taken up with difficulty, and at a greater cost than would be the case at high water. It also happened that the elevation of Lake Winnipegosis at the time, was equally low, and therefore it was found that the channel at the mouth of the Mossy river, Lake Winnipegosis, required deepening and widening in order to permit steamboats to come in and out with safety, so the plant was kept doing the necessary work at the latter point.

The total number of cubic yards excavated was 13,721 at a total cost of \$4,514.82. The material was mostly hardpan and boulders, which was cast south of the channel.

The anticipation of the tug led to preparation being made, with a view of taking the plant to Fairford river at the latter end of the season 1904, but since the tug was not available until this season, the plant was kept doing the necessary work at the point indicated above.

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*Red River.*

During the fiscal year 1904-05, the work of the dredge 'Winnipeg' was confined to the old channel, at the mouth of the Red river, excepting that 2,400 cubic yards were dredged at the entrance of the Slough, West Selkirk, and a few days work done opposite the Selkirk wharf extension in the first of the season, before the dredge was towed down to the mouth of the river. The old channel at the mouth of the river, was maintained to such a depth as to permit steamers, drawing 9 feet of water, to come in and out with as much safety as possible. It was found that a great deal of filling in occurred every storm from the northerly directions. The total quantity excavated is 54,820 cubic yards. The total expenditure, that also covers ordinary repairs, was \$16,501.64.

Owing to the long tow of material to deep water, consequently the extreme consumption of fuel, the cost of the work is pretty high. It is also thought that the compounding of the tug 'Sir Hector's' engine should be done in the interest of economy. No work was done at the new channel, owing to the fact that no money was authorized to be expended doing the sheet piling or protection work at the lake shore, across the sand bar, in order to prevent the sand that overlays the clay from running back into the excavation during storms. The amount and extent of dredging to be done after the protection work is completed, could also be rapidly done to such a width and depth so as to permit the entrance of vessels within a short time after the work is started.

## DREDGE VESSELS REPAIRS.

The work of re-constructing the hull of the tug 'Victoria' was continued during the months of July, August and part of September, 1904, when it was completed. The labour account doing this work, is high, owing to the fact that native oak, which requires a great deal of dressing, was used entirely from the keel up, excepting the decking which was built of British Columbia fir. The work was done throughout in a first-class, good, workmanlike manner, so that the hull is staunch and reliable, and could stand a somewhat heavier and more powerful boiler and engine, that would also produce a more useful and effective vessel than the old one was, in fact, it would seem as if the renewal of both the old boiler and engine has become a matter of necessity, although in a fair state of repairs.

It has been in use for twenty-five years, and therefore out of date, and it follows, not economical in fuel, also none too reliable. A new and very much needed boiler was installed in the tug 'Sir Hector.' The old one was put ashore after twenty-five years use, showing signs of having been repaired and patched up to such an extent, as to justify its replacement by a new one. Pony pumps that had been in use for an equal number of years, and practically worn out and unreliable, were replaced by new ones, so that, generally speaking, with ordinary repairs and maintenance, the machinery might be said to be in fair working condition. The two scows were also hauled up, recaulked and repaired generally, ordinary repairs done to the dredge, tug 'Sir Hector's' hull, &c.

The dredge 'Manitoba' and tug were hauled up and recaulked, anchor slides put in, and therefore stood a regular repairing and general over-hauling after a season's operations.



## PROVINCE OF BRITISH COLUMBIA.

## DREDGING.

*Fraser River.*

This service, by reason of its magnitude and varying conditions, is by far the most important in the province. The question of the conservation of the Fraser river has been a burning topic of discussion with the New Westminster Board of Trade and other influential bodies both in this city and at other places along its banks, and has formed the subject of many reports both main and supplementary. Suffice it to say that the system adopted has been approved, and is in accordance with the best methods of modern engineering practice, being by dredging where necessary and protection of the banks from erosion by mattrassing or pile-protection, where the material so washed in is menacing navigation. In conjunction, this system, although not completed has been found to be effective and a uniform depth of 27 feet at ordinary high spring tides exists and is maintained from the sand heads, at the mouth of the river, to above Sapperton, some two miles above the city of New Westminster, a distance of twenty miles. The fluctuation of the tide varies from 10 feet at the mouth of the river to 5 feet opposite New Westminster. With increased appliances in the shape of additional dredges, as has been recommended, it is only a matter of a comparatively short time to insure a ship channel, from the Gulf of Georgia to the city of New Westminster, with a depth of 30 feet at ordinary high tide. The principal obstacle has been Annieville bar, only a short distance below New Westminster, or between Annacis island and the south shore. This bar has been dredged during the past year and a straight channel obtained, 3,000 feet long by 150 feet wide and 25 feet deep at extreme low tide. It is intended to make another cut, widening the channel to 300 feet.

The navigation between New Westminster and Chilliwack, the present head of navigation on the Fraser, some fifty miles above New Westminster, is the ordinary river navigation where 7 to 8 feet at low water is all that is required, and which is obtainable. Two regular steamers run daily the entire year, except when stopped by ice.

In response to the request of the British Columbia Settlers' Association we built two dams across the main Nicomen Slough and another channel, so as to retain the current in main river instead of following Nicomen Slough and flooding valuable land adjoining. Two more, but smaller dams, require to be built to entirely close the channels leading from the river to Nicomen Slough, and will be constructed next year under the appropriation for this service. The dredge 'King Edward' was used to reinforce these dams by depositing a large amount of gravel in front which has made them secure against any pressure of water.

We have also built a new scow 60 x 20 feet with steam hoist and 'A' frame, for handling the many anchors in use by the 'King Edward' in securing pipe line and dredge, and which is also fitted up as a blacksmith and carpenter shop and attached to the dredge 'King Edward.' In the near future much of the outfit of this dredge will need renewal. The large centrifugal pump shell and runner will have to be replaced by an entirely new one. Cutter shaft and head, suction and discharge pipes are all listed for renewal. They have now, with the exception of pump shell, been four years in steady work and at times in trying material. The pump shell was renewed two years ago and now has a bad crack some 5 feet in length, but made secure by a steel plate patch 7 feet long secured by stud bolts.

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The expenditure in connection with the above service has been as follows :—

Wages.. . . .	\$ 8,832 22
Provisions.. . . .	1,952 49
Material.. . . .	3,193 31
Tug-hire.. . . .	295 00
Team-hire.. . . .	722 54
Fuel.. . . .	121 55
Pile-driver.. . . .	560 25
Building scow.. . . .	949 78
Contingencies.. . . .	39 40
Superintendence.. . . .	1,545 45
Tide gauges.. . . .	493 70
	<hr/>
	\$ 18,705 69

Dredge 'King Edward':—

Wages.. . . .	\$ 3,396 59
Provisions.. . . .	790 80
Material.. . . .	696 30
Fuel.. . . .	1,136 75
Tug-hire.. . . .	5 00
Contingencies.. . . .	29 10
	<hr/>
	\$ 6,054 54
	24,760 23

Snag boat 'Samson'—

Provisions.. . . .	\$ 230 19
	<hr/>
Total.. . . .	\$ 24,990 42

#### *Nanaimo Harbour.*

There has been no expenditure on the above service. The appropriation was placed in the estimates to meet the probable contingency of a further survey of the harbour, or the necessity of clearing up the detritus that collects in front of the wharfs of coaling docks. The work of dredging done in main entrance, or south channel, to the harbour some years ago, when a depth of 30 feet at low tide was obtained, has met all requirements of navigation thus far.

#### *Victoria Harbour.*

The expenditure on this service for the past fiscal year is practically the annual cost of maintenance and working expenses of the dredge 'Mud Lark', representing a current monthly expenditure of \$1,407.40. This monthly cost for working expenses is gradually increasing owing to the deterioration of the hull and machinery. The work upon which this dredge has been engaged is the deepening of the main entrance channel from the outer wharf to the docks in the middle or inner harbour; deepening in front of and around the new Canadian Pacific railway docks, in James bay, to a uniform depth of 16 feet at low spring tides; and dredging in front of the marine railway, of the Victoria Machinery Depot Company, in the upper harbour. When the weather would admit, the material dredged was deposited in deep water outside the harbour, at Brothie ledge, and when stormy, in front of the retaining wall, across James bay,

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from whence it is intended, by means of the 'King Edward,' to pump up and deposit it inside the wall and around the foundations in rear of the new Canadian Pacific railway hotel. I estimate there is 50,000 cubic yards of material, to be moved. This will complete the filling in behind the retaining wall commenced two years ago, but suspended at the request of the city authorities until such time as the work on the foundations was sufficiently advanced to admit of our continuing the filling. The most convenient time to resume this work will be during the winter months, when the usual run of ice in the Fraser river makes our work there rather hazardous, as it is impossible to maintain our discharge pipes and pontoons in position.

In deepening the main entrance channel to 16 feet, a larger area of Dredger Rock has been uncovered and will have to be removed, for which an additional sum has been asked for in 1905-06. We are much hindered in our work by bad weather as it is in a very exposed position and open to southerly, south-easterly, and south-westerly winds which roll in such a swell that it is impossible to work, and we have already broken our spuds in endeavouring to hold the dredge in position. Much valuable time is thus lost.

They are now agitating in Victoria a scheme for deepening and enlarging the entire harbour, to a depth of 25 feet at low tide. It is doubtful if the area can be made sufficiently large to warrant the expense such a depth would entail, as the space is too contracted for the large ocean-going ships engaged in the Australian and China trade. The difficulty could be better met outside of the outer wharf, but, under the most favourable circumstances, will prove a very expensive undertaking.

The expenditure for the past year on this service has been as follows :—

Wages.....	\$ 9,006 53
Provisions.....	2,224 15
Material.....	2,530 31
Fuel.....	2,299 25
Water.....	55 45
Tug hire.....	773 00
Total.....	<hr/> \$ 16,888 69

## DREDGING PLANT, BRITISH COLUMBIA.

The work of the hydraulic dredge 'King Edward,' snag boat 'Samson,' and dipper dredge 'Mud Lark,' is chargeable to the above appropriation when these vessels are not engaged on any special service. In the case of the dredge 'Mud Lark,' which has been engaged entirely during the past year on the work of deepening Victoria harbour, her services are charged to that appropriation. The cost of the old snagboat 'Samson' was, with but little variation, \$10,000 annually. Our new and larger snag boat, now in use, will possibly slightly exceed this amount. The work of the dredge 'King Edward,' which was confined entirely to dredging, consumed the balance of the appropriation.

The duties of the snag boat consist in keeping the river clear of snags as far as practicable, maintaining and moving buoys into position, surveys and other duties appertaining to the service on the Fraser river, which keep her constantly employed the entire year, with the exception of two or more weeks during the winter months, when the ice is running in the Fraser, not always of annual occurrence.

The dredge 'King Edward,' when not under repairs, is steadily engaged in the work of dredging at various points; this year exclusively in the Fraser river. During the year she has been engaged in dredging a channel through the Sand Heads, at the entrance to the north arm; deepening in front of the Ross-McLaren and Brunette saw-mills, immediately above New Westminster at the request of the respective owners; clearing out the old channel at Ladner; cutting a channel through

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Annieville bar, 3,000 feet in length, 150 feet wide, and 25 feet deep at low tide ; and in opening the channel at Chilliwack giving better access to the wharf recently built, where she is now engaged and near completion. The intention is to widen the channel through Annieville bar to 300 feet so soon as we have ascertained the action of the freshet on the cutting already made. The formation of this bar is a contradiction to the usually accepted theory as it makes during high water and an extreme velocity of current, and scours with lower water and lessened velocity. The variation of tide at this point which is opposite, or a little below the city of New Westminster, is 5 to 6 feet, giving 30 feet at ordinary high water. With some further work between Steveston and Port Guichon, this depth can be secured between New Westminster and the Gulf of Georgia and should meet all the requirements of this port. As it is they have 27 feet, so that, if considered as a tidal harbour, as many much more important ports are, there is sufficient water for vessels of 3,000 tons and over.

The work of the dredge 'Mud Lark' is described under the head of Victoria Harbour, to which her operations have been exclusively confined.

The expenditure in connection with the service of dredging in British Columbia for the past year has been as follows :—

*Dredge 'King Edward.'*

Wages. . . . .	\$10,545 93
Provisions. . . . .	2,777 28
Material. . . . .	2,476 74
Fuel. . . . .	6,071 97
Water. . . . .	39 86
Tug hire. . . . .	3,325 00
Contingencies. . . . .	63 95
Paid in Ottawa. . . . .	50 00
	<hr/>
	\$25,350 73

*Snag Boat 'Samson.'*

Wages. . . . .	\$ 7,005 58
Provisions. . . . .	1,793 09
Material. . . . .	599 44
Fuel. . . . .	1,525 87
Water. . . . .	66 74
Contingencies. . . . .	69 10
	<hr/>
	\$11,059 82

NEW DREDGING PLANT.

*Victoria Harbour.*

This appropriation is designed to cover the cost of the construction and equipment of a new snag boat for the Fraser river to replace the old one, now twenty years in use and condemned as unsafe by both the boiler inspector and the inspector of hulls, and a new steel tug and tender to take the place of the present small tug 'Princess,' some sixteen years in use, which is not of sufficient size or power to move the heavy dredge 'Mud Lark,' to which she is attached, in other than harbour waters.

The contract for the snag boat was awarded to Mr. Wm. Turpel, proprietor of Turpel's Ways, Victoria, for the sum of \$22,500. The contract was signed on August 15, 1904, and the boat completed on May 30 last, at a cost of \$25,179.38. The contract for the steel tug was awarded to the Victoria Machinery Depot Company, of Victoria, for the sum of \$24,750, and was signed on August 8, 1904, but the work will not be

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completed before the end of December next, at a cost of probably \$30,000. Both these boats according to the terms of contract were to be completed six months after the date of signing the contract, or on February 15 and February 8, respectively. The cause of the delay and increase in cost was the contention on the part of the builders of the machinery, in both cases the Victoria Machinery Depot, that the boilers specified for both boats were too small to give the results in power and speed called for in the specification, and other alterations to the machinery, &c., found necessary during construction. The matter was referred to Ottawa to adjust and was finally allowed.

The new snag boat was delivered at the port of New Westminster on May 29, 1905, where, after the six days official test, it was accepted subject to ordinary conditions. She has now been in commission since June 1, and has been found very satisfactory and admirably adapted for the purpose for which she was built, which calls for an exceptionally stiff hull to withstand the very severe strain to which, at times, it is subjected.

The steel tug promises to be equally satisfactory and is an excellent piece of work. Both hull and machinery have been built under the strict supervision of the respective inspectors, and she promises to be the best boat of her class on the coast.

*New Snag Boat 'Samson.'*

Length—115 feet.  
Breadth—30 feet.  
Depth—6 feet.  
Draught—3 feet.

*Steel Tug and Tender.*

Length between perpendiculars—85 feet.  
Breadth of beam, moulded—17 feet.  
Depth, moulded—12 feet  $4\frac{1}{2}$  inches.  
Maximum depth to bottom of 6-inch keel—10 feet 6 inches.  
Maximum approximate displacement—180 tons.  
Indicated horse power—280.  
Speed—10 to 11 knots.  
Coal capacity—50 to 60 tons.

## DREDGE REPAIRS, BRITISH COLUMBIA.

The bulk of this appropriation was expended in repairs to the dredge 'King Edward'. The clean sharp sand met with at the mouth of the north arm of the Fraser told very severely on her large centrifugal pump, necessitating heavy new castings on front and rear faces, and on the suction and discharge pipes. An entirely new pump will be necessary next year. A renewal of the suction and discharge pipes, which are worn to the thinness of paper in a great many places and the rivetting cut almost entirely away, is also necessary. We have prolonged the life of the discharge pipes by turning them over from time to time but they will not last much longer.

The expenditure under this appropriation has been as follows—ordinary repairs representing those we are able to do ourselves, and extraordinary those where we have been obliged to have the work done by the machine shops :—

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*Dredge 'King Edward.'*

Repairs, ordinary. . . . .	\$ 1,088 46	
“ extraordinary. . . . .	2,167 97	
	<hr/>	\$ 3,256 43

*Snag Boat 'Samson.'*

Repairs, extraordinary. . . . .	\$ 900 53	
	<hr/>	900 53

*Dredge 'Mud Lark.'*

Repairs, ordinary. . . . .	\$ 232 20	
“ extraordinary. . . . .	410 03	
	<hr/>	642 23

Total. . . . .	\$ 4,799 19
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# DRY DOCKS.

The Dominion government owns and operates three dry docks, viz.: the Lorne dry dock at Lévis, in the province of Quebec; the Kingston dry dock, at Kingston, in the province of Ontario; and the Esquimalt dry dock, at Esquimalt, near the city of Victoria, in British Columbia.

## LÉVIS DRY DOCK.

This dock was kept in an efficient manner during the fiscal year 1904-05. Only the usual repairs, required for the proper maintenance of this property, were carried on during the year.

The total expenditure incurred during the year is \$13,143.49.

Total amount of revenue, \$16,454.38.

## ESQUIMALT GRAVING DOCK.

The action of the naval authorities in dismantling and abandoning Esquimalt as a naval station, or as the rendezvous and headquarters of the North Pacific Squadron has made a radical change in the status of this station. With the naval custom withdrawn and the competition of the Esquimalt Marine railway, our occupation is practically gone and we are maintaining the dock at a heavy annual expense with only a nominal return from the dockage of an occasional ship too large to be accommodated or berthed on the Marine railway, the capacity of which is limited to 2,000 tons the same time, to be of use, the dock has to be, and is, kept up to the same standard as before the withdrawal of the navy.

As will be seen from the list attached to this report, receipts from the vessels docked and dues collected during the past year only aggregated \$4,626.54, as against from \$14,000 to \$15,000 in former years.

The annual appropriation for this service has remained a constant quantity of \$13,300 of which the wages of dockmaster and staff take \$10,000, and the balance goes in the upkeep of the dock generally.

There have been no extraordinary repairs in connection with the dock during the past year, and the expenditure has been in detail as follows:—

Wages. . . . .	\$ 9,700 79
Material. . . . .	1,524 71
Telephone. . . . .	84 00
Water. . . . .	505 50
Fuel. . . . .	1,105 50
Contingencies. . . . .	16 00

Total. . . . . \$12,936 50

## KINGSTON DRY DOCK.

During the fiscal year 1904-05, the dock was occupied thirty-eight days in summer, and one hundred and fifteen days in winter. The number of vessels docked was twenty-eight, with aggregate tonnage of 11,945 tons.

The dock was kept in good working order and only the usual repairs, necessary for the proper maintenance, were carried on.

The total expenditure during 1904-05, was \$5,521.87.



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## RIVIÈRE DU LIÈVRE LOCK.

This lock is situated at Poupore on the Rivière du Lièvre, twelve miles above Buckingham, in the County of Labelle. It was built to overcome the difficulties of navigating the Little rapid, the dam in connection with it also flooded the Long rapid, six miles above and rendered the river navigable up to the foot of High Falls, a total distance of nineteen and a half miles above Buckingham.

Below the last named place, the Lièvre river forms a succession of rapids and falls, which give extensive water power to a number of saw and pulp mills, over a distance of three miles, and the river empties into the Ottawa river twenty-one miles below the city of Ottawa. This stretch of navigable water above Buckingham, is an important accommodation to the settlers of the upper part of the Rivière du Lièvre, who have no railway accommodation and it is only of late years that a highway has been built on one side of the river.

The lock and dam were completed in 1892, at a total cost of \$233,658.65, they have been kept in good working condition until October 11, 1903, when an extensive landslide occurred on the west side of the river just below the dam. The landslide covered a distance of about one and a half miles below the dam and a width of about one-quarter of a mile from the river bank; some 200 acres of land under culture were destroyed together with farm houses and outbuildings, the farmers and their families barely escaping with their lives, the accident occurred at five o'clock in the morning. The river was completely choked for six hours, the water above rose to a height of 15 feet above its original level and then scoured out numerous small channels through the earth filling formed by the landslide. The upper part of the dam was shoved against the head of water above and 7 feet in height of its top was carried away on a length of 200 feet, the dam is 250 feet long between abutments. Two days after the accident an officer of the department was ordered to the place with instructions to help as much as possible the carrying on of the traffic.

In a few days one of the channels through the earth embankment, had been scoured out to a sufficient depth to permit one of the small steamers doing the service on the river to be pulled through it by means of winches and intended to make the run above the dam, the other steamer remained below. A portage road one and a half miles long was built on the east side of the river to connect its two navigable parts, two freight sheds, 20 x 12 feet, one at each end of the road, were constructed and a contract was awarded to carry the freight and passengers by teams over the portage road.

At its session of 1904, parliament voted an appropriation of \$20,000 to be applied towards the reconstruction of the dam.

The amount expended during the fiscal year 1903-04, was \$5,517.15.

During the fiscal year 1904-05, the work of reconstructing the dam was carried on and completed. The top of the dam was covered with steel sheets  $\frac{1}{2}$ -inch thick. The slide in the centre of the dam, was made 12 feet longer than the previous one.

Some 3,000 feet of three-ply booms were constructed and put in position, above the dam. A ledge of rock, 25 feet by 30 feet, was blasted 10 feet deep, so as to prevent logs from jamming at low water.

The expenditure during 1904-5, amounted to \$29,234.92.

## YAMASKA LOCK.

In 1886, this department constructed a lock and dam, at Ile à Cardin, on the Yamaska river, one and three fourth miles below the village of St. Michel de Yamaska, and about four and a half miles from the mouth of the river; the lock gives a lift of  $5\frac{3}{4}$  feet.

During the last fiscal year, the sum of \$2,680.30 was expended to maintain and operate the lock.

## SLIDES AND BOOMS.

The Dominion government owns and operates slide and boom works, built to facilitate the passage of square timber, round logs, flatted and dimension timber &c., on the River Ottawa and tributaries, on the lower forty miles or so of the St. Maurice, and in the Trent and Newcastle district, between Fenelon Falls and Heeley's Falls.

In the subjoined reports, the superintending engineers of the river works, Messrs. G. P. Brophy, F. X. Thos. Berlinguet and S. Clegg, give particulars relative to the construction, improvements and repairs carried out under their supervision on government slides, booms, piers, dams, streams, buildings, &c., during the fiscal year, the expenditure incurred for staff, maintenance, improvements, &c., the quantities of the various descriptions of timber that pass through their works, and other information of general interest and utility to lumbermen and the public at large.

## REPORT ON THE OTTAWA RIVER WORKS.

(By G. P. Brophy, Superintending Engineer.)

SIR,—As requested by you, in your communication No. 3,213, of July 14 last, I have the honour to submit the following report relating to the works under my charge, for the fiscal year ended June 30, 1905.

The foundations of the different river works were examined at low water season and the necessary repairs were commenced in the autumn and continued during the winter months.

The following is a description of the repairs executed.

## STATIONS ON THE OTTAWA RIVER (MAIN STREAM).

*Carillon Station.*

The repairs at this place were only of a trivial nature and consisted in painting the boats and scows, and patching and reshingling roof of storehouse.

*North Chaudiere Station.*

In the latter part of September, 1904, a portion of the upper slide, at its outlet, was torn away. The break was temporarily repaired without delay, and last spring the slide was thoroughly overhauled. A pier was built at the outlet to replace that carried away, and the bottom was formed with solid timbers. The floor of the slide throughout, was covered with iron bars, held in place by countersunk headed spikes. Two new glances were built, on either side, at foot, to protect the side piers. The sides were patched in many places, and the stop-log posts, where worn, were filled in with new material. The guide booms at entrance to slide, were straightened and properly secured; new planking and cross-fenders being provided to stiffen them.

At the lower basin, a new slide for use in seasons of low water was constructed, and the top portions of the old one were renewed. The low water slide is 90 feet long, 12 feet wide at mouth and 7 feet at outlet. It rests on solid rock, the sills being set

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3½ feet centres and well rock-bolted. The sides are formed of crib-work, filled with stone, while the bottom is of hemlock, 3 inches thick, covered with flat iron bars.

The high water slide is 60 feet long, 10 feet at intake, and 7 feet wide at outlet. It is composed of solid timber, in bottom and sides, and is sheathed with iron, to prevent wear, as much as possible.

The west gate, used to regulate the pitch of water in the lower basin, having become somewhat unsafe, was made more secure. In order to resist the pressure against the bulkhead and thus strengthen the foundations, a pier was built in the rear, and this carried braces supporting the bents of the bulk-head.

The guide booms were replanked, and additional stone was placed in the retaining dam.

#### *South Chaudiere Station.*

The ordinary repairs were made to the numerous buildings, at this station. The main storehouse was sheathed with brick siding. During the winter months, snow was frequently removed from roofs of the buildings and from the general yard. A close watch was kept on the booms and aprons; ice was cut from around these stringers and the chains were adjusted many times, so that no damage might result to these works.

#### *Cheneaux Station.*

Two anchor piers, each 16 feet by 18 feet and 8½ feet high, were built and sunk in place, with the usual floating buoys, to which the booms are attached. The floating platforms at gaps were removed, and an iron spindle was provided to operate the gap timbers.

#### TRIBUTARIES OF OTTAWA.

##### *Gatineau River.*

The top covering, cap-pieces and pickets of the main boom were patched and renewed; the connecting links and screw-bolts were straightened and properly adjusted. The tops of four of the piers which support the main boom, having become very much dilapidated, had to be rebuilt, from low water mark. These are piers Nos. 2, 5, 7 and 8. Pier No. 2 is 27½ feet by 29½ feet at base, 16 feet by 18½ feet at top and 14½ feet high; No. 5 is 35 feet square at bottom, 15 feet by 16 feet at top and 14½ feet high; No. 7 is 27 feet by 32½ feet at base, 17 feet by 23 feet at top and 15 feet high; and No. 8 is 18 feet by 25 feet and 15 feet high. These piers are supplied with timber fenders at their corners and are covered in front with 3-inch plank. A quantity of stone was placed around foundation of pier No. 8 to prevent the base being scoured out.

About midway between the Canadian Pacific bridge and the mouth of the new canal, on west side of river, two sections of cribwork were built, to prevent the bank from being washed out at this particular place. Both sections are 9 feet wide, and 8 feet high, filled with stone, the length of one being 70 feet and that of the other 50 feet.

On the reserve, in close proximity to the station house, a new storehouse was built. This is a frame building 20 feet by 30 feet and 1½ stories high, suitable to store chains, ropes, tools, crabs, windlasses, boats, &c. Repairs were also made to the remaining old piers, plank and timber fenders being used to reinforce the corners.

##### *Madawaska River.*

**Arnprior Station.** At the foot of the Arnprior slide, the upper part of the protection pier on the west side, was rebuilt. The portion replaced was about 3 feet high,

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90 feet long and 10 feet wide. The crib is filled with stone and planked on top with 3-inch material, forming an apron. Above the entrance to slide, the top of a pier, 18 feet by 26 feet, supporting the main guide boom, had to be renewed, as the upper timbers were carried away.

**At High Falls Station.**—The pier on the south side, at head of slide, was rebuilt with new timber. This is 53 feet long, 10 feet wide and 9 feet high. The platforms of bulk-heads were renewed and ten new stop-logs were provided for slides, four being for upper bulk-head and six for the lower one. The guide boom between the two bulk-heads was reconstructed. It is composed of four piles of timber 14 x 14 inches, 123 feet in length, bolted together by screw-bolts of 1-inch diameter, and is sheeted on face with maple plank, 4 inches thick. The crab frames on bulk-heads and the sheeting on booms and flat dams were also patched where defects were found.

**At Ragged Chute.**—Some lengths of the main boom, which had become very much water logged, were hauled out to dry, and placed in position again when the ice left the river in the spring.

**At Chain Rapids.**—The planking on the different booms and dams was patched where found necessary.

*Coulonge River.*

At the retaining boom, about four and a half miles below the High Falls slide, the upper portions of two of the piers supporting the boom, were torn away, and consequently these had to be replaced. One of these is 18 feet by 22½ feet at water line, and 15½ feet by 18½ feet at top, while the other is 19 feet by 23½ feet at water line and 15 feet by 19 feet at top; both being 11 feet high above water mark. New stone filling, to the extent of 117 cubic yards, had to be provided for these piers, to replace that swept away.

At High Falls station, the posts of the bulk-heads having been sprung out of position, new uprights had to be placed in the rear of the posts, to prevent further movement and also to provide a proper bearing for the stop-logs. At two different places, the slide structure was repaired, one section being 74 feet in length, and the other 90 feet. At the former place the three bents, 15 feet high and four stringers were set to carry the superstructure; and eighteen posts, seven cross sills and sheeting in sides and bottom were also laid in the slide proper. In the other section, four bents 16 feet high were set, and the adjacent ones were stiffened by extra braces of 3-inch plank. At different places the sheeting in sides and bottom in slide were patched where worn thin, and altogether sixty-six new posts and thirty-three cross sills were renewed. The foot boards and braces were patched, and at places where the slide is of a great height, chains and rods were set, attached to bolts placed in the solid rock to steady the structure as much as possible. A breach, 33 feet in width, in the main governing dam was covered with 3-inch plank. Two snubbing posts were placed in two boom piers above the slide entrance, and new chains were set in the guide boom leading to the slide.

*Black River.*

At High Falls station, the slide was repaired throughout its whole length. Decayed and worn planks were renewed and replaced by new ones. A portion of the timber slide, near the foot, which had become sprung out of place, was taken down and rebuilt. A large quantity of iron bars was laid in the sides and bottom of slide to protect the planking as much as possible. Two eye-bolts with chains attached to rock bolts were placed a short distance from entrance to slide, to stiffen the structure, where it passes over a deep gulch. A supply of pine timber and maple, birch and pine plank was purchased for future repairs at this station.

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Considerable difficulty is experienced in keeping the slide works at High Falls, in a proper state of repair, as it is now many years since they were thoroughly overhauled, so that repairs of a more heavy character will shortly have to be undertaken, in order that these works may be placed in a serviceable condition.

*Petewawa River.*

At the mouth of the Petewawa river, the top timbers of a pier supporting the retaining boom were removed and replaced by new ones. A new snubbing post was placed in this pier, and additional mooring and skein chains were provided for booms.

At First Chute station, the upper portion of the pier dam on south side of river, near waste gate, was renewed and 51 cubic yards of stone ballast were placed in the crib.

In the spring of 1894, two glance piers at the Third Chute suffered damage and, for the most part, had to be rebuilt. The lower one, on north side, is 133 feet long, 16 feet wide and 9 feet high; sheeted in front with 4-inch plank and protected by  $\frac{1}{2}$ -inch iron bars, where the wear is greatest. The upper pier, immediately above the C.P.R. bridge, on north side, is 138 feet long, 12 feet wide, and of an average height of 7 feet, and is also sheeted in front with 4-inch plank. A new pier dam was also built, on south side, a short distance below C.P.R. bridge. This forms a glance and is 90 feet long, 9 feet wide and 6 feet high, and sheeted with 4-inch plank on face. Two piers, at the feeding gap, were raised two courses, in order that they might be the better adapted for the work they have to perform.

At Half Mile station, some of the stringers and ties of the flat dam were replaced, and the front of the dam was patched with 4-inch plank, 16 feet long, where the old material had been torn off.

At Crooked Chute station, the sills, stringers, posts and sheeting of the slide were overhauled and patched, in many places, where defects were found. At the upper end of the retaining boom about  $1\frac{1}{2}$  miles above the slide, a snubbing pier was rebuilt. This is 12 feet by 16 feet and  $7\frac{1}{2}$  feet high, and is filled with stone. The retaining boom was strengthened by placing splice pieces at the joints, secured by chains.

At Lake Traverse station, two side dams were repaired and some rock obstructions were blasted, to improve the running in the timber channel.

At McDonald's station, the floor of the slide at outlet was laid with hardwood plank; the foundation timbers of the piers at foot were repaired, and stone-filling which had been carried away, was replaced. The sides of the slide at entrance, and also at curve on north side, near outlet, were replaced with new material. The planking on the main governing dam was patched where defective; and a quantity of brush and gravel was placed in front of dam, at its foundation, to reduce the leakage as far as possible.

*Dumoine River.*

High Falls station.—As the cost of keeping the slide at this station in proper repair (the structure being over 3,000 feet in length), was necessarily very great, and as the cost in these repairs increases from year to year, as the works become older; it was decided to abandon the old slide, as a means of passing timber and logs at this particular place, build a short slide at head of the rapids and improve the lower sections of the chutes by building the usual side dams and blasting rock obstructions, thus making the improvements of a more permanent nature. These works were undertaken last winter and finished in due time for driving operations the following spring.

A short distance above the foot of the rapids, two glance piers were constructed. The one on east side is 240 feet long, 10 feet wide and 8 feet high; while the other on opposite side of river is 60 feet long, 10 feet wide and 7 feet high. At a point

## SESSIONAL PAPER No. 19

about 1,400 feet above old slide outlet, a pier was built between an island and the main shore, to block a shallow and rocky channel. This dam is 50 feet long, 11½ feet high and 14 feet wide at base, drawn in to 7 feet at top, the front being sheeted with plank 4-inch thick.

The new slide is 85 feet in length, 16 feet wide at intake and 12 feet at outlet. The sides are formed of cribwork and the floor is of timber laid on cross sills bolted to solid rock.

The waste gate piers are 14 feet long, 10 feet wide and 13½ feet high. A large quantity of rock was blasted in the bed of the river, over the whole extent of the rapids. At many places, coffer-dams and tramways had to be built to divert the water and give access to the works, so that the improvements could be proceeded with.

Last spring the water in the Ottawa river and its tributaries was not as high as is usually the case, but nevertheless it kept at a very favourable pitch, for driving purposes, during the summer months which followed, and the drives, for the most part, were taken out without difficulty, the only exceptions being those from the remotest sections of the districts.

The following statement prepared from information furnished by the Collector of Revenue of the department, shows the number of pieces of the various descriptions of timber that passed these works and the revenue accrued thereon, during the fiscal year ended June 30, 1905.

Square timber.. . . .	3,372	pieces.
Saw logs.. . . .	4,404,675	"
Boom and dimension timber.. . . .	137,780	"
Cedars.. . . .	85,369	"
Railroad ties.. . . .	636,120	"
Fence posts.. . . .	251,018	"
<hr/>		
Total.. . . .	5,518,334	pieces.

Also 16,040·86 cords of pulp wood. The revenue accrued on the above was \$44,652.03.

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STATEMENT showing Expenditure for Repairs, &amp;c., to Works on the Ottawa River and its Tributaries, and to Bridges at Ottawa, and Roadway and Bridge Approaches between Ottawa and Hull, for Fiscal Year ended June 30, 1905.

NAMES OF STATIONS.	Province.	Electoral District.	Expenditure July 1, to Dec. 31, 1904.		Expenditure Jan. 1, to June 30, 1905.		Expenditure July 1, 1904, to June 30, 1905.	
			\$	cts.	\$	cts.	\$	cts.
<i>Ordinary Repairs: Ottawa River Works—</i>								
Carillon Station.....	Ont.	County of Prescott	1,411	58	28 99	28 99	28 99	
North Chaudière Station.....	Que.	District of Wright.	459	28	1,960 44	3,372 02	3,372 02	
South " " " "	Ont.	City of Ottawa.	105	00	1,533 86	1,993 14	1,993 14	
Cheneaux Station.....	Ont.	South Riding of County of Ren- frew			482 18	587 18	587 18	
							5,981 33	
Gatineau River.....	Que.	District of Wright	3,376	18	4,902 03	8,278 21	8,278 21	
Madawaska " " "	Ont.	South Riding of County of Ren- frew			945 29	1,400 75	1,400 75	
Conlonge " " "	Que.	County of Pontiac	1,151	15	1,893 05	3,014 20	3,014 20	
Black " " "	Que.	" " "	148	12	1,809 77	1,957 89	1,957 89	
Petewawa " " "	Ont.	North Riding of County of Ren- frew and Nipissing	1,200	01	1,906 90	3,106 91	3,106 91	
Dumoulin " " "	Que.	County of Pontiac	1,814	53	4,735 45	6,549 98	6,549 98	
				8,143 28		16,162 66	24,307 94	
Total for Ottawa River Works.....							30,289 27	
<i>Ordinary Repairs: Bridges at Ottawa and Roadway and Bridge Approaches between Ottawa and Hull—</i>								
Dufferin Bridge.....	Ont.	City of Ottawa.	125	50	154 01	279 51	279 51	
Sappers' " " "	Ont.	" " "	208	00	180 01	338 89	338 89	
Chaudière Slide Bridge.....	Ont.	" " "	116	00	244 25	360 25	360 25	
Union Bridge.....	Ont. & Que.	City of Ottawa and District of Wright.	464	00	242 17	706 17	706 17	
		District of Wright.	4	50	44 25	48 75	48 75	
Hull Slide Bridge.....	Que.	City of Ottawa and District of Wright.	746	75	878 38	1,625 14	1,625 14	
Roadway and Bridge Approaches between Ot- tawa and Hull.....	Ont. & Que.			1,665 64	1,743 07		3,408 71	
Total for Bridges.....								
<i>Extraordinary Repairs—</i>								
Union Bridge and approaches thereto.....	Ont. & Que.	City of Ottawa and District of Wright.....					3,637 09	
Approaches to Dufferin and Sappers' Bridges.....	Ont.	City of Ottawa.					1,809 00	
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## REPORT ON THE ST. MAURICE RIVER WORKS.

(By F. X. Thos. Berlinguet, Superintending Engineer.)

THREE RIVERS, October 14, 1905.

EUGÈNE D. LAFLEUR, Esq.,

Chief Engineer,

Department of Public Works of Canada,  
Ottawa.

Sir,—As requested in your letter No. 3188, I have the honour to submit the following report on the St. Maurice river works for the fiscal year ended June 30, 1905.

The fluctuation of the water level on the St. Maurice river, during the time of the floating of the logs during the commercial season of 1904, has been the highest since 1873, but, on many of the tributaries, the duration of the freshets has been too short for the number of logs to be floated, consequently many of the logs were left for the following season.

The handling of the booms was entirely done with the steam warping tugs. These tugs have not only done the work expected of them, but far exceeded the expectation, especially the one with twin screws.

The purchase of these tugs has proved a great success. The full price of the three tugs now in use on the St. Maurice river works, was saved in the first season of operation.

The twin screw tug is considered a great improvement to the side wheels tugs, especially for the handling of booms, &c.

When the water was at its lowest pitch, the foundations of 133 piers were examined, also 64,385 lineal feet of booms, and put in good condition for the next season. The work was continued during the early spring months, in order that everything would be in readiness for the opening of commercial season of 1905.

These works may be described as follows :—

Pointe à Trudel booms.—On the 40th mile of the St. Maurice river, 1,412 lineal feet of booms, also three mooring piers were put in good condition for the commercial season.

Pointe Madeleine booms.—On the 39th mile, 2,588 lineal feet of booms, also ten piers were examined. Stone ballast was put in the piers where necessary. A number of boom chains were supplied.

St. Jacques des Piles booms.—On the 38th mile from the outlet, 2,176 lineal feet of five to six ply booms, also seven mooring piers were put in good condition. A number of boom chains were supplied. Stone ballast was put in the piers where necessary, and ordinary repairs were made to boats, scows, station house and fences.

St. Flore booms.—On the 34th mile, 1,311 lineal feet of three and four ply booms were put in good condition. A number of boom chains were supplied.

Petites Piles booms.—On the 33rd mile, piers Nos. 9, 10, 11 and 12 were raised to strengthen the mooring of 4,238 lineal feet of five and eight ply booms.

Pointe à Walsh booms.—On the eastern side of the river, on the 33rd mile, 2,400 lineal feet of booms were stretched from the said point up. A number of boom chains were supplied.

Rapide des Hêtres booms.—On the 26th mile, 2,600 lineal feet of three and two ply booms were put in good condition, and the dam closing the eastern channel was raised a few feet and stone-filled. A number of guy chains were supplied. Piers Nos. 1, 2 and 3 were raised and strengthened.

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Point à Bernard booms.—On the 23rd and 24th mile, repairs were done to piers Nos. 1, 2, 3, 4 and 6. A number of boom chains were supplied.

Shawinigan slide.—On the 22nd mile. A section of the bottom and sides of the slide were repaired by replacing the wornout timber and planking with new material, the apron faced with hardwood, and the projecting spikes in the bottom and sides of the slide were countersunk.

Ile aux Tourtes booms.—On the 18th mile, 11,805 lineal feet of one to seven-ply booms were put in good condition and were left stretched for the winter to close the eastern channel above the island and the western channel below the said island. A number of boom chains were supplied.

Three Rivers booms.—Pier No. 3 was built in the eastern channel, and piers Nos. 5, 11, 13, 15, 25 and 27 were repaired by replacing the worn-out timber and planking with new material.

The statement furnished by the Collector of slide and boom dues shows that 3,540,383 logs have passed the government works during the season 1904.

## REPORT ON THE TRENT AND NEWCASTLE DISTRICT WORKS,

(S. Clegg, Superintending Engineer.)

PETERBOROUGH, September 29, 1905.

EUGÈNE D. LAFLEUR, Esq.,

Chief Engineer,

Department of Public Works.

SIR,—In accordance with your circular, No. 3210, dated Ottawa, July 14, 1904, I beg to submit the following report on the Trent and Newcastle district for the fiscal year ending June 30, 1905. These works extend from Chisholm's rapids, on the Trent river, to Fenelon Falls, at Cameron lake. A distance of about 150 miles.

### HEALEYS FALLS.

The works here are in a fair state of repair, the department has not spent any money on the upkeep of the works here this year. The Rathbun Company put three new stop-logs in the timber slide.

### HASTINGS.

This slide is in good repair, the boom at the entrance to the slide, on the south side, was broken and carried away by the ice. This boom was repaired, new timber put in and some minor repairs done to the glance piers.

### LITTLE LAKE PETERBOROUGH.

There is about one-half mile of double boom and four glance piers. The boom was taken off in the fall and replaced in the spring and some minor repairs done.

### KETCHEWANNE LAKE.

The boom here extends from Young's point to Lakefield, a distance of about four miles. This boom was damaged considerably by the ice and wind in the spring, and lost quite a number of the anchors; it was repaired and new anchors and chains

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put on where necessary and the boom overhauled and put in first-class shape. One of the piers, in Ketchewannoe lake, was rebuilt from the water line, and some minor repairs were made to the other piers.

## BURLEIGH FALLS.

Put in a new stiff boom 150 feet long; rebuilt the old boom; put in one new glance pier and raised the old pier two courses of timber, put new sheeting on the side dam.

## DEER BAY.

The boom here was repaired and put in position for the season.

## BUCKHORN.

All the double booms were hauled out of the water in the fall and skidded up. It was overhauled and put in good repair, replaced in the water in spring, and put in position for the season's work.

The side pier at the foot of the slide had some stone filling put in.

## FENELON FALLS.

The boom here was overhauled in the spring and put in good working order for the season's operations. Some minor repairs were made to the slide.

## BRIDGES AND ROADS.

It may be stated that, in the older provinces of the Dominion, the federal government has confined itself as a rule to take under its exclusive control and make provisions towards the construction and maintenance of important interprovincial road bridges and bridges required across waterways.

In the sparsely settled districts of the North-west Territories, the government of Canada has undertaken to provide for the erection and maintenance of ordinary road bridges over large streams; bridges that are urgently needed to afford uninterrupted communication through trails and highways of national importance, which neither the municipalities to be more immediately benefited by the structures, nor the territorial authorities most directly concerned, could be expected to erect and maintain at their sole expense.

During the last fiscal year works have been executed on the following bridges:—

BRIDGES AT OTTAWA, AND ROADWAY AND BRIDGE APPROACHES BETWEEN OTTAWA AND HULL—  
ORDINARY REPAIRS.

Sappers' bridge.—A top covering of 1½-inch hemlock plank was laid on the sidewalk, on the south side of this bridge.

The exposed portions or ironwork of both the Sappers' and Dufferin bridges, received two coats of special bridge paint, after the surface had been thoroughly scraped and cleaned of rust, dirt and old paint.

The roadway of the Chaudière bridge, which spans the south Chaudière timber slide and hydraulic channels, was cleaned at different times.

The Hull slide bridge was cleaned often and the rubbish carted off.

The roadway and bridge approaches between Ottawa and Hull, were cleaned at regular intervals; the sidewalks, guard and hand rails were repaired, the grating and water pipes were cleaned at several places where the pavement had sunk from grade, the blocks were taken up and relaid properly.

During the winter months, surplus ice and snow were removed from the sidewalks and roadways of the different bridges and approaches leading to Hull, as has been the usual practice in the past.

## APPROACHES TO DUFFERIN AND SAPPERS' BRIDGES.

A supply of Nepean sandstone paving blocks was purchased for the easterly approaches to these bridges, the intention being to take up the scoria blocks now in place and relay the area with sandstone, as the latter is much better adapted to roadways where there is any considerable grade.

## UNION BRIDGE AND APPROACHES THERETO—EXTRAORDINARY REPAIRS.

In order to widen the roadway and thus provide better accommodation for the heavy vehicular traffic on the Union bridge and both its approaches, the sidewalk on this bridge and at either end, on the west side, was removed and the space occupied by it was appropriated for roadbed purposes.

The additional width of roadway is of much more value for use of vehicles than for a sidewalk, especially as pedestrians had little occasion to go to and fro on that side of the thoroughfare.

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The changes were started in the month of June last, so that only a comparative amount of work was accomplished at the end of the period covered by this report. (June 30, 1905.)

At the southerly approach to Union bridge, the sidewalk was 6 feet wide and 130 feet in length, carried on a rough cribwork. These timbers were removed and a retaining wall of masonry was built, surmounted by a concrete curb, 8 inches thick, and 12½ inches high above the pavement. A close board fence was erected along this portion of the road. It is 6 feet high at southerly end and increases in height to 9 feet at the bridge.

The work has been carried on during the present fiscal year, and at this date is almost completed.

## ONTARIO AND QUEBEC.

## BRYSON BRIDGE.

Bryson, in the County of Pontiac, is situated on the north shore of the Ottawa river, fifty miles west of Ottawa. The nearest railway station is Campbell's Bay, on a branch line of the Canadian Pacific railway. At Bryson, the Ottawa river is divided into two channels by Calumet island, which is twelve miles long and four miles wide, the population of the island is about 1,400.

In 1886, a bridge was built across the northern channel of the Ottawa river, to connect Calumet island with the mainland. It consists of two mid-stream steel spans, respectively 209 feet and 169 feet long, a wooden bent approach 47 feet long and riprap abutment on the island side; on the Bryson side the approach consists of a wooden Howe truss span 68 feet long and timber bents for a length of 71 feet, the spans are supported by wooden piers partly filled with stone.

The amount required for the construction of the bridge was obtained from four different sources; the municipality of Calumet island contributed \$5,000, the municipality of Bryson, \$2,500; the Quebec government, \$8,000, and the federal government, \$6,000.

During the last session of parliament the sum of \$15,000 was voted, to renew the wooden approaches with steel girders, and rebuild the shore piers and abutments with concrete.

In the fall of 1904, the planking and stringers of the two existing steel spans, were renewed.

The amount expended during the fiscal year 1904-05, was \$2,233.39.

## PORTAGE DU FORT BRIDGE.

Portage du Fort is on the north shore of the Ottawa river, in the County of Pontiac, Quebec, sixty miles above the city of Ottawa.

At this place an island divides the Ottawa river into two channels, called the north and south channels, the village of Portage du Fort is on the north shore of the north channel.

In the fall of 1901, with contributions from the local governments of Quebec and Ontario, this department completed a steel bridge across the south channel. The wooden bridge over the north channel was then unsafe for traffic, and it being considered as forming part of the interprovincial bridge uniting the two provinces, the department decided also to renew this bridge with a steel structure of one span, 200 feet in length.

In June, 1903, a contract was entered into with Mr. Thos. Moran, of Arnprior, for the construction of the two abutments and the approaches on both sides. The con-

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tract for the steel work was awarded on August 25, 1903, to the Locomotive and Machine Company, of Montreal.

The work on the masonry abutments and approaches was started in July, 1903, and at the end of November of that year, the abutments were nearly completed and ready to receive the superstructure. The abutments are built U-shape, on a rock foundation, of first-class rock faced ashlar masonry, laid in Portland cement mortar. The approaches consist of riprap walls, sloping one in one on their outer faces, filled between with earth, 24 feet wide at top and provided with gas pipe railing.

The steel superstructure was completed in December, 1904, it consists of a rivetted through span, 200 feet in length, strongly built and of fine appearance.

The amount expended on this work during the fiscal year 1904-05, was \$8,694.07.

#### GRAND RIVER BRIDGE.

Grand River Bridge, over the Grand river, in the village of York, in the County of Haldimand, is a highway bridge, maintained by the government.

At the last session of parliament, the sum of \$1,000 was appropriated for repairs to the bridge, and on May 23, 1904, orders were issued to proceed with the work, by day labour.

The work was completed by September 10, 1904, and consisted in the renewing of the flooring of the whole length of the bridge, and the placing of temporary bents alongside the middle pier of bridge.

On August 30, 1904, further authority was granted to expend \$195.20 for urgent temporary repairs to the centre pier of the bridge, which had been undermined and cracked by the action of the freshets. The work was performed between March 16, and April 1, 1905, and consisted in the placing of stone filling, under and about the pier, and other temporary repairs.

In April, 1905, authority was granted to expend \$500 for repairs of a more permanent nature to this centre pier, but owing to the depth of water and strong current the work had to be postponed, and had not been commenced up to June 30, 1905.

The total expenditure during the fiscal year 1904-05, is \$1,210.55.

#### NORTH-WEST TERRITORIES.

##### ATHABASKA, LESSER SLAVE LAKE AND PEACE RIVER LANDING WAGON ROAD.

This road extends from Athabaska river to Peace River Landing, by way of Lesser Slave lake. It will open the north county to settlers from Edmonton to Peace river, a distance of 350 miles.

At last session of parliament, a sum of \$15,000 was granted to be expended as follows :—\$10,000 on the road from Lesser Slave lake to Peace River Landing, a distance of 100 miles, and \$5,000 from Lesser Slave lake to Athabaska river, a distance of 250 miles.

This work consisted, especially on the north trail, in grading and levelling; in skidding low places; building ditches and small bridges, and burning the thick forest in close proximity to the road in order to allow the sun to dry up the ever-damp soil.

The south trail required more preliminary work; the old road was left aside for fifty miles, which has proven to be impracticable as it lay within the heart of the Swan Hills, at a height in some places of 700 feet above ordinary level. A pass was found at twenty-five miles east of Lesser Slave Lake settlement, and, by its use, the Swan Hills are crossed without any difficulty. The main work, therefore, on this south trail consisted in cutting down trees and opening this new road beyond the hills. The total expenditure during 1904-05 amounted to \$3,537.46.

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## BATTLE RIVER BRIDGE.

In 1888, a contract was awarded for the construction of a wooden bridge across the Battle river, at Battleford, but the contractors having failed to carry out the work, the bridge was completed by this department in 1890.

In the spring of 1900, owing to severe floods, the bridge collapsed.

In 1902, a steel superstructure was erected on the old piers.

In the spring of 1904, during the floods, it was seen that the old crib piers could no longer safely carry the superstructure, and therefore, a contract was given to John Foley, of Ottawa, for the construction of concrete piers, built on the same centre line, 15 feet from the old piers. The work has progressed very satisfactorily and is expected to be completed by the end of October, 1905.

The expenditure during the fiscal year amounted to \$2,137.76.

## EDMONTON BRIDGE.

During the last fiscal year the sum of \$95.85 was expended in making some slight repairs to the flooring of the Edmonton bridge.

## LANGEVIN BRIDGE.

This bridge is situated on the Bow river, at Calgary; it was constructed in 1887. It is a Howe Truss structure of three spans, with trestle approach on the south side.

During the last fiscal year, the sum of \$484.30 was expended in repairs; the three spans were brought to camber and the approaches put in good condition. This bridge is now in a fairly good state of repair, considering its age, and unless unforeseen accidents take place, will stand for another year.



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## CEMENT.

CEMENT LABORATORY,

OTTAWA, September 18, 1905.

E. D. LAFLEUR, Esq.,

Chief Engineer, Public Works Department.

SIR,—I have the honour to inclose herewith the annual report of this branch of the department for the year ended June 30, 1905.

I have the honour to be, sir,

Yours obediently,

(Signed) GEO. E. PERLEY,

*Engineer in charge.*

Since June 30, 1904, all samples submitted to this branch of the department have been fully tested and reported upon to you, chiefly among them being :—

The cement used at the Quebec extension of breakwater.

Three Rivers wharf, Depot Harbour landing pier and Masson wharf.

In all there were 237 samples submitted for test purposes, of which 107 were submitted by engineers of this department, 4 by the Railways and Canals department, 2 by the Marine department, 8 by cement agents, 4 by contractors and the remainder by manufacturers.

The cement industry, within the last year in Canada has increased to large proportions, new works have been inaugurated in the North-west Territories, Raven lake, Belleville, Ontario; Hull, Quebec; and Sydney, Cape Breton.

The first three use marl and clay as a basis, Hull uses limestone and clay and Sydney uses slag and lime.

The Hull work is the most up to date plant on the continent, the cement turned out by this plant has given every satisfaction as far as the tests have been carried out, the only drawback that may occur, being the likelihood of an outcropping of dolomitic limestone which will increase the magnesia and thereby reduce the effective life of the cement.

All these cements have been thoroughly tested physically and chemically analysed, and a record kept to check each year's output of the manufacturers.

During the year a 150,000 pound Riehle testing machine for beams, &c., was installed in one of the rooms recently used for physical tests; to set this machine properly, it was necessary to remove the floor and blast out the rock underlying it to a depth of 11 feet; in order to secure a dry foundation, a drain was made and connected with the exterior one.

As a foundation for the machine a pedestal of concrete was built as well as for the motor, shafting has been installed and arranged, thus having all machinery operated by the motor.

When the installation of all the machines was completed they were tested and found to give good satisfaction.

Below will be found a series of tranverse tests of reinforced concrete beams made with the new machine.

The first beam tested was made at headquarters, the others were made at Champlain, Depot Harbour and at the post office at Ottawa.

Test piece.—

W. I. reinforced concrete beam.

Dimensions—12 by 12 inches by 20 feet.

Distance between supports—18 feet.

Mixture—1, 2, 5, hand mixed.

Brand of cement—Star.

Stone broken to  $\frac{1}{2}$ -inch.

Age—One month.

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Reinforcing 4,  $\frac{3}{4}$ -inch plain W.I. bars, 2 inches from face equidistant from neutral axis.

Load.	Increments of Deflection.	Total Deflection.	Remarks.
	In.	In.	
1,000 lb. ....	Nil.	Nil.	
1,500 " ....	$\frac{1}{16}$	$\frac{1}{16}$	
2,000 " ....	Nil.	$\frac{1}{16}$	
2,500 " ....	$\frac{3}{32}$	$\frac{3}{32}$	
3,000 " ....	$\frac{1}{8}$	$\frac{1}{8}$	First crack, hair line.
3,500 " ....	$\frac{1}{8}$	$\frac{1}{8}$	
4,000 " ....	$\frac{1}{8}$	$\frac{1}{8}$	Crack visible across bottom.
4,500 " ....	$\frac{1}{8}$	$\frac{7}{16}$	
5,000 " ....	$\frac{3}{16}$	$\frac{1}{2}$	Third crack, visible across.
5,600 " ....	$\frac{3}{16}$	$\frac{5}{8}$	Cracks opening on sides.
6,000 " ....	$\frac{3}{16}$	$\frac{11}{16}$	
6,500 " ....	$\frac{3}{16}$	$\frac{13}{16}$	Principal crack $\frac{1}{2}$ inch wide.
7,000 " ....	$\frac{3}{16}$	$1\frac{1}{4}$ to 3	Top face crushed, W. I. bars clipped.

NOTE—Allowing for discrepancies due to crude method of measuring deflection, the elastic limit was probably reached with a load of 5,600 lbs. after which the increments of deflection increased rapidly, the total deflection becoming greater than  $\frac{1}{10}$  span.

Second beam tested December 16, 1904.

Test piece:—

Reinforced concrete X-tie for Depot Harbour.

Dimension—12 by 12 inches by  $5\frac{1}{2}$  feet.

Distance between supports—8 feet 2 inches.

Mixture—1,  $2\frac{1}{4}$ ,  $2\frac{1}{2}$ , hand mixed.

Brand of cement—Samson.

Stone—Hornblendic gneiss 1-inch.

Age—Four months.

Reinforcing, 4,  $\frac{1}{2}$ -inch W. I. bars, equidistant from neutral axis, and 2 inches from faces, clinched at ends.

Load.	Increments of Deflection.	Total Deflection.	Remarks.
	In.	In.	
1,400 lb. ....	Nil.	Nil.	
4,000 " ....	$\frac{1}{8}$	$\frac{1}{8}$	
6,000 " ....	$\frac{11}{32}$	$\frac{11}{32}$	Cracked to 3 inches up sides.
6,500 " ....	Nil.	$\frac{11}{32}$	
6,600 " ....	$\frac{1}{32}$	$\frac{11}{32}$	Failing by crushing top face.
6,700 " ....	$\frac{1}{32}$	1	
7,000 " ....	$\frac{1}{32}$	$1\frac{1}{8}$	Crack opened $\frac{3}{8}$ inch.
5,000 " ....	$\frac{1}{32}$		Load beam could bear after rupture.

NOTE—After failure the rods slipped at one end, probably on account of a  $2\frac{1}{2}$ -inch stone which was loosened from the mixture at this point.

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Third beam tested December 20, 1904.

Test piece :—Reinforced concrete X-tie made at Depot Harbour.

Dimension—12 inches by 12 inches by 10 feet 6 inches.

Total weight of beam—1,380 pound.

Weight per cubic foot—135 pound.

Mixture—1, 2½, 4½, hand mixed.

Brand of cement—Samson.

Stone—Hornblendic gneiss, 1 inch.

Age of beam, 4 months.

Distance between supports—8 feet 10 inches.

Reinforcing, 4½ inches W.L. bars equidistant from neutral axis and 2 inches from faces, clinched at ends.

Load.	Increments of Deflection.	Total Deflection.	Remarks.
	In.	In.	
1,000 lb. ....	$\frac{1}{16}$	$\frac{1}{16}$	
1,500 " ....	$\frac{1}{16}$	$\frac{1}{8}$	
2,000 " ....	Nil.	$\frac{1}{8}$	
2,500 " ....	"	$\frac{1}{8}$	
3,000 " ....	$\frac{1}{16}$	$\frac{1}{4}$	
3,500 " ....	Nil.	$\frac{1}{4}$	
4,000 " ....	"	$\frac{1}{4}$	
4,500 " ....	$\frac{1}{16}$	$\frac{5}{16}$	
5,000 " ....	$\frac{1}{16}$	$\frac{3}{8}$	
5,500 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
6,000 " ....	Nil.	$\frac{1}{2}$	
6,500 " ....	$\frac{1}{16}$	$\frac{9}{16}$	
7,000 " ....	$\frac{1}{16}$	$\frac{5}{8}$	First crack, hair line.
7,500 " ....	$\frac{1}{16}$	$\frac{1}{2}$	$\frac{1}{10}$ span ap.
8,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	Crack $\frac{1}{8}$ inch wide.
8,500 " ....	$\frac{1}{16}$	$\frac{11}{16}$	
9,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
9,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
10,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
10,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
11,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
11,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
12,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
12,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
13,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
13,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
14,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
14,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
15,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
15,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
16,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
16,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
17,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
17,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
18,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
18,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
19,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
19,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
20,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
20,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
21,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
21,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
22,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
22,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
23,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
23,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
24,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
24,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
25,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
25,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
26,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
26,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
27,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
27,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
28,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
28,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
29,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
29,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
30,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
30,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
31,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
31,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
32,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
32,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
33,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
33,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
34,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
34,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
35,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
35,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
36,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
36,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
37,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
37,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
38,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
38,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
39,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
39,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
40,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
40,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
41,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
41,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
42,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
42,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
43,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
43,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
44,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
44,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
45,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
45,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
46,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
46,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
47,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
47,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
48,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
48,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
49,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
49,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
50,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
50,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
51,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
51,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
52,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
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55,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
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58,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
58,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
59,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
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60,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
60,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
61,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
61,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
62,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
62,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
63,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
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66,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
67,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
67,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
68,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
68,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
69,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
69,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
70,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
70,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
71,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
71,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
72,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
72,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
73,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
73,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
74,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
74,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
75,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
75,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
76,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
76,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
77,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
77,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
78,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
78,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
79,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
79,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
80,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
80,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
81,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
81,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
82,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
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86,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
86,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
87,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
87,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
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95,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
96,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
96,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
97,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
97,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
98,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
98,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
99,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	
99,500 " ....	$\frac{1}{16}$	$\frac{13}{16}$	
100,000 " ....	$\frac{1}{16}$	$\frac{1}{2}$	

NOTE—Rods had not slipped, after supporting maximum load, beam held up for considerable time, load lighter, deflection only increasing.

Fourth beam, tested March 15, 1905.

Test piece :—Reinforced concrete beam, made at Champlain, Que.

Dimension—12 inches by 12 inches by 5 feet 6 inches.

Distance between supports—5 feet.

Proportion of mixture—1, 2, 4.

Brand of cement—White Star, Belgium.

Kind of stone—Shale.

Age of beam—Two months.

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Reinforcing,  $2\frac{1}{2}$  inches along and near the outer face, and  $2\frac{3}{4}$ -inches rods along and near the inner face.

Load.	Increments of Deflection.	Total Deflection.	Remarks.
	In.	In.	
6,400 lb .....	$\frac{1}{16}$	$\frac{1}{16}$	Crack $\frac{1}{2}$ inch wide.
8,000 " .....	$\frac{3}{32}$	$\frac{3}{32}$	
9,700 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
9,800 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
10,600 " .....	$\frac{1}{8}$	$\frac{1}{8}$	

NOTE—This beam was broken by accident before it was ready to be tested, so the first deflection and the hair-line crack were not noted.

Fifth beam, tested March 20, 1905.

Test piece:—Reinforced concrete beam, made at Post Office, Ottawa.

Dimension—12 inches by 7 inches by 17 feet.

Total weight of beam—1,440 lbs.

Weight per cubic feet—146 lbs.

Distance between supports—16 feet.

Proportion of mixture—1 cement, 4 stone.

Brand of cement—Rathbun's Star.

Kind of stone—Nepean sand stone.

Age of beam—2 months.

Load.	Increments of Deflection.	Total Deflection.	Remarks.
	In.	In.	
660 lb .....	$\frac{1}{16}$	$\frac{1}{16}$	Hair-line crack, 8 inches from centre.
800 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
1,000 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
1,200 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
1,400 " .....	$\frac{1}{8}$	$\frac{1}{8}$	
1,600 " .....	$\frac{1}{8}$	$\frac{1}{8}$	Crack opening. Elastic limit.
1,800 " .....	Nil.	$\frac{1}{8}$	
2,000 " .....	$\frac{1}{16}$	$\frac{1}{8}$	
2,200 " .....	$\frac{1}{16}$	$\frac{1}{8}$	
2,400 " .....	$\frac{1}{16}$	$\frac{1}{8}$	
2,600 " .....	$\frac{1}{8}$	$\frac{1}{4}$	Crack from $\frac{1}{16}$ to $\frac{1}{4}$ inch wide.
2,800 " .....	$\frac{1}{8}$	$\frac{1}{4}$	
3,000 " .....	$\frac{1}{8}$	$\frac{2}{8}$	Casting snapped.
3,200 " .....	$\frac{1}{8}$	$\frac{2}{8}$	

NOTE—It was found on removing the concrete from the cast iron after breaking, that the  $\frac{1}{2}$ -inch rod at base of casting had stretched 2 inches and showed no sign of breaking under the load of 3,200 lbs.

A number of crushing tests have also been made of bricks, stone, mortars, &c., for the architects branch and for general information.

The engineers of the department have been advised on the best method to adopt in mixing mortar, concrete, &c., information has also been given to the Railways and Canals, Militia and Marine and Fisheries Departments.

On account of the continued increase of work in this branch, it was found necessary to enlarge the staff, two assistants have been employed, one on July 15 and the other on August 10, 1904.

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Since the time they joined the branch, they are becoming proficient in the art of manufacturing briquettes, the tests being more uniform, give better satisfaction than heretofore.

A very instructive meeting of the Society of Testing Materials in the United States, was attended by me in June. The papers read and commented upon were dealt with by the manufacturers, users and testers, the latter, both physical and chemical, thus giving the three faces of the material and a better insight to the article generally.

### CONCLUSION.

I desire to call your attention to the increase in the number of works under construction as well as to the nature of those works. Some years ago all our harbour works were built of timber cribwork or pile-work, but, of late, we are introducing, as much as possible, a permanent style of construction, and where appropriations of parliament have been sufficient, substantial structures of steel or concrete, or both combined, have been erected.

We have remodelled our cement testing laboratory and made of it one of the most modern of its kind, equipped with the best and latest testing machines.

In addition to the general increase in ordinary work, we are, at present, nearing the completion of the Georgian Bay Ship Canal Survey, under the able direction of Mr. Arthur St. Laurent, C.E.; the results of this extensive work will soon be available and the progress report, published as an appendix to this report, will, I am sure, not only prove of interest to men of the profession, but to the general public who take an interest in the development of our great waterways.

It is with sincere regret that I record the death of Major Henry A. Gray, resident engineer, Toronto. A man of sterling qualities and an engineer of undisputable abilities, Mr. Gray leaves behind him a vivid souvenir of his strong personality.

In closing this report, I wish to extend to all my assistants my most sincere thanks for their faithful services and untiring energy, and to again assure them that I fully appreciate their efforts to promote the efficiency of this branch of the department and the interest of the public.

EUGENE D. LAFLEUR,  
*Chief Engineer.*

APPENDIX TO PART 4

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INTERIM REPORT

ON THE

GEORGIAN BAY SHIP CANAL SURVEY

BY

Arthur St. Laurent, C.E.

5-6 EDWARD VII., A. 1906

DEPARTMENT OF PUBLIC WORKS OF CANADA,  
GEORGIAN BAY SHIP CANAL,  
OFFICE OF THE ENGINEER IN CHARGE,  
OTTAWA, November 3, 1905.

Sir,—I have the honour to submit herewith my annual report regarding the prosecution of the Georgian Bay Ship Canal survey work, during the fiscal year ending June 30, 1905.

This report deals particularly with the organization and progress of the survey undertaken by the department, without arriving at any conclusions, the field work not being completed.

I have the honour to be, sir,

Your obedient servant,

A. ST. LAURENT,  
*Engineer in Charge.*

EUG. D. LAFLEUR, Esq.,  
Chief Engineer,  
Public Works Department,

## PRESENT SURVEY.

### DESCRIPTION OF WORK.

#### *Staff organization and limits of each section of the survey.*

During the session of 1904, the sum of \$250,000 was granted by parliament, for the purpose of making a complete survey of the Ottawa river navigation route, and arrive at a close estimate of cost.

The proposed navigation route extends from the mouth of the French river down to Montreal, a distance of about 425 miles.

It follows the French river and Lake Nipissing, passes, at the height of land, through Trout, Turtle and Talon lakes, follows the Mattawa river to its junction with the Ottawa, and thence down the Ottawa as far as Montreal, leaving the bed of the river occasionally where conditions are such that it is advisable to do so.

It was decided from the beginning that the information gathered to study the feasibility of the route, to prepare plans and to make a close estimate of cost for the whole route, should be entirely original and that old plans from old partial surveys should be used only as preliminary information and for general guidance.

This will involve actual detailed surveys, on a larger scale perhaps than anticipated, and it will make the survey relatively expensive but for a project of that magnitude and importance, it will prove much more satisfactory in the end, to collect actual and complete data from the present field operations.

To this end, and to get results within reasonable time, it was deemed necessary to place a large force of engineers in the field. In August, 1904, orders were issued to prepare for this work, to collect the necessary camping outfit, instruments, &c., in order to make an early start.

The force was organized at the end of September and work commenced about the beginning of October. In the instructions given, which were supplemented by complete survey rules, the object of the survey is stated as follows :—



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The immediate object of the survey is, that when the notes are reduced and plotted, a location may be projected on the plans, for a ship canal of not less than 22 feet in depth, a profile drawn and a correct estimate made of the kind and amount of all material found necessary to be excavated, the kind, character of foundation and dimensions of all walls, locks, dams and other structures, also the estimating of all extra right of way required for the canal proper, where it leaves the bed of the rivers and for spoil banks and overflowed area.

The route to be surveyed was divided into three districts, designated as the Nipissing, Ottawa and Montreal districts, each in charge of a district engineer.

Each district was sub-divided into three sections, each in charge of a sectional engineer, thus making nine (9) sections in all.

Each sectional engineer, has under him two assistant engineers, two rodmen, two chainmen and seven or eight labourers.

The names of the parties in charge and the limits of each district and section are as follows :—

Eugene D. Lafleur, chief engineer.

A. St. Laurent, engineer in charge at Ottawa.

S. J. Chapleau, district engineer, in charge of sections 1, 2 and 3, between the Georgian bay and the head of the Rapids des Joachims, a distance of about 170 miles.

E. J. Rainboth, district engineer, in charge of sections 4, 5 and 6, from the head of the Des Joachims rapids to the foot of the Chaudière falls, at Ottawa, a distance of about 140 miles.

C. R. Coutlee, district engineer, in charge of sections 7, 8 and 9, from the foot of the Chaudière falls, at Ottawa, to Montreal, a distance of 120 miles.

A. T. Genest, assistant engineer at headquarters.

A. McDougall, hydraulic engineer.

A. R. Dufresne, in charge of test boring parties.

*Section No. 1.*

A. J. McDougall, in charge.

From Lake Nipissing, over divide through Trout and Turtle lakes to Lake Talon, a distance of twenty-one miles, but involving the investigation of several possible routes.

*Section No. 2.*

H. P. Bell, in charge.

From head of Lake Talon, through the Mattawa river into the Ottawa, at Johnson's rapids, a distance of twenty-four miles, requiring also the examination of two or three different routes.

*Section No. 3.*

Wm. Cross, in charge.

From Johnson's rapids, through Deux Rivières and Rocher Capitaine rapids, to head of Des Joachims, a distance of fifty-six miles.

*Section No. 4.*

G. L. Griffith, in charge, until January, 1905, replaced by A. J. Matheson.

From head of Des Joachims rapids, through north and south channels of Allumette island, to Fort Coulonge, about seventy miles.

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*Section No. 5.*

A. Robert, in charge.

From Fort Coulonge, through Calumet, Portage du Fort, Snows, to head of Chats rapids, a distance of forty miles.

*Section No. 6.*

W. G. Warner, in charge (until April 25, 1905, replaced by H. A. K. Drury).

From head of Chats rapids, through Lake Deschenes, to the Gatineau river, a distance of about forty miles.

*Section No. 7.*

E. E. Perrault, in charge.

From Gatineau river, down the Ottawa, through Grenville rapids, to Carillon rapids, a distance of about seventy miles.

*Section No. 8.*

C. E. Macnaughten, in charge.

From Carillon rapids, through Lake of Two Mountains and Ste. Anne's rapids, to head of Lake St. Louis, a distance of twenty-five miles, but requiring a survey of over fifty miles.

*Section No. 9.*

L. R. Voligny, in charge.

From head of Lake St. Louis to Montreal. With investigation of the Back river channel to the St. Lawrence, a distance of twenty-five miles, but requiring a survey of fifty miles.

Since these parties were organized, another small party has been placed on Lake Nipissing, to take soundings across the lake and collect general information, as to flooded lands at high stages of the water. Mr. F. H. Peters, in charge.

Moreover, as it was absolutely necessary to refer all the levels of the survey to a known datum, it was decided to adopt the American datum of mean sea level, and Mr. Chaloner, who has been doing precise levelling for this department for many years, under the direction of Mr. R. Steckel, was detailed to transfer the elevations as determined by the United States Coast and Geodetic Survey to different points on the proposed canal route.

## HYDRAULIC ENGINEER.

The project of deep navigation from the Georgian bay to Montreal involves many important hydraulic problems, which have to be considered. Among these are the question of water supply of the summit level between Lake Nipissing and the Mattawa river, the many different water-power interests on the Ottawa river, the lumber interests, the question of creating storage reservoirs to keep the low water level at a higher stage during dry seasons, &c., &c. It was important to arrange to make careful and uniform investigations with regard to these questions, and a recommendation was made to have an expert hydraulician engaged on this work. Mr. A. McDougall, of Ottawa, was appointed to investigate and report fully concerning these matters.

In order that the survey may have some degree of uniformity, a set of rules was prepared by the engineer in charge, by request of the chief engineer, and these were distributed to each party for their guidance and information. These rules are very complete and need only to be supplemented from time to time as to detailed work, in accordance with conditions encountered.

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## PROGRESS OF WORK.

The different parties after having outfitted at Ottawa and received their instruments, &c., left for their respective destinations about the end of September and were fully at work all over the route by October 2, 1904.

Up to the end of the fiscal year, the progress of the work may be summarized as follows:—

## NIPISSING DISTRICT.

The district covers that part of the Ottawa river that lies between Des Joachims rapids (which is some forty odd miles above Pembroke), and Mattawa; then the Mattawa river, Lake Nipissing and the French river to the Georgian bay on Lake Huron.

That part of the country lying between Des Joachims rapids and Lake Nipissing was divided into three sections, a lake party being subsequently formed to investigate the part of Lake Nipissing which lies between North Bay and Vases creek, on the north-east shore of the lake, across to Frank's bay or the upper entrance of the French river.

After a careful investigation of all available plans and profiles of previous surveys, it was determined to obtain topography to the highest possible contour of all flooded areas that would of necessity follow the erection of dams and other regulating works.

From Lake Nipissing to the head of the Mattawa river, in all about 22 miles distance, intervenes the height of lands which separates the waters of the Lake Huron basin and those of the Ottawa river.

About three miles from North Bay commences a chain of lakes, Trout, Turtle and Talon lakes, which lie almost in a direct line with the head of the Mattawa, the highest of these, Trout lake, being 23 feet above Lake Nipissing.

In former proposals for this canal, the Lake Nipissing level was proposed to be raised and Trout lake lowered a few feet in order to form a summit level having Lake Nipissing as a feeder.

It was also proposed to lower Trout entirely to the level of Nipissing, thus involving very heavy rock cuttings all through the height of land to the Mattawa.

The raising of Lake Nipissing 16 or 20 feet as proposed, which might have been a fair proposition half a century ago, seems now impracticable, as the shores of the lake which are very low have since been well settled. It would involve the flooding of a portion of the town of North Bay and of many villages and farms, and also the main track of the Canadian Pacific railway.

The cutting down of the whole summit level to Lake Nipissing level would entail a very large expenditure to give a first class canal for large boats. For these reasons it was deemed advisable to consider a summit level at or about Trout lake elevation, and to study thoroughly the question of water supply for that level, as there seemed to be a possibility of obtaining from various sources the water required.

With this end in view a raised water surface profile was adopted with a summit level embracing Trout, Turtle and Talon lakes, all to the Trout lake level, and between the lower end of the latter lake to the adopted raised level of the pool at the head of Des Joachims rapids.

The survey has proceeded on these lines, and with the information being gathered, it will be possible to project upon the maps the location, for any size canal to a depth of 24 feet draft having a bottom width of 300 feet, from which profiles may be drawn and a correct estimate made, even if it is ultimately decided to cut down to Nipissing lake level, in case the water supply investigation proves that it will be inadequate at the higher reach proposed. On locations where curvature will exist, the

contour has been sufficiently established to cover any possible increase in the bottom width of prism, hereafter to be established to include a curve of 6°.

Between these different lakes, and in fact at the head of the *Mattawa* itself, two or three different possible routes have been found by investigation, through reconnaissance and track traverse. Comparative profiles have been obtained of these different routes, and their centre line sectional areas computed to grade for comparison. This has led to the investigation of different locations between two given points and has proven valuable in eliminating routes that for the time looked promising.

The progress of the work in the Nipissing district has been very satisfactory.

On section 1, the topography has been completed between Lake Nipissing and the foot of Turtle lake, together with the greater part of the *Mattawa* river below Turtle lake. There remains about one month's work to complete this section, and it is proposed to employ the same party to continue soundings on Talon lake and to obtain supplementary information with regard to Lake Nipissing and the French river.

Section 2, which is located between *Mattawa* and Talon lake, will be completed, it is expected, about the latter part of December.

There are three possible routes between the Talon lake level and Lake Champlain on the *Mattawa*, which are being investigated. One from Sand bay on Talon lake to the Paresseux falls on the *Mattawa*, one following the natural line of the *Mattawa* from Talon chute, and the third passing by Talon chute also, to the lower end of the Pimisi lake, thence across to Johnson's lake, Smith's lake, Crook's lake, Moore lake, and running into the *Mattawa* again through a blind arm at the western end of an expansion of the River *Mattawa* called Lake Champlain or Plein Chant.

It has been found necessary to investigate other routes than the *Mattawa* river itself, on account of its narrow width and irregular course at the head; there are also two changes of direction of 90° each within a short distance, and which occur in close proximity to possible lock structures. The two other locations now being investigated are much straighter and shorter. On the Pimisi and Johnson lakes location, this would necessitate a diversion of the main line of the Canadian Pacific railway in order to prevent two crossings; but the reconnaissances already made have proved that this can be accomplished by an easier grade and straighter alignment than now exist.

On section No. 3, the triangulation, closed traverse, soundings and topography have been completed from *Mattawa* to nearly the foot of Deux Rivières rapids and close check levels made between *Mattawa* and Rocher Capitaine, including in all about 54 miles of closed traverse and levels.

There remains some very rough and tedious work to do on that section above and below Rocher Capitaine and it is not expected that the survey party will reach the Des Joachims rapids, the end of the section, before January, 1906.

The country in this district is in many places exceptionally rough and very thickly wooded; in consequence of which the topography necessary for the estimate can only be obtained very slowly. At Rocher Capitaine, it may be found advantageous to leave the bed of the river, at the head of the rapids, to follow a valley presumably an old river bed, which joins the river again immediately below the rapids. This would save many degrees of curvature and probably the construction of a high dam. This valley will be surveyed and developed as to contours, levels, &c.

#### LAKE PARTY.

During December, 1904, a party was formed to obtain all soundings between the north east shore of Lake Nipissing in the vicinity of North Bay and Frank's bay at the entrance of the French river. This was in order to connect with the surveys and soundings made in 1901, under the direction of the late J. W. Fraser.

Two routes have been investigated: one to the north and one to the south of the Manitou islands.

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On the completion of this work this party was detailed to establish the 5 foot and 10 foot contours above the high water plane of Lake Nipissing, with a view of ascertaining the probable area of flooded lands in case it would be found advisable to maintain the lake level above normal height.

The party is now engaged on this work.

In view of the work being done by the precise level party in carrying a line from the established Rouses's Point and Coteau Landing B. Ms. through to North Bay along the line of the Canadian Pacific railway system, to the datum of mean sea level, at Governor's Island, N.Y. (to which all hydrography of the upper lake charts are reduced), automatic gauges have been placed at Toronto, Collingwood, and foot of the French river, and their zeros connected to permanent B.Ms. in their immediate vicinity.

The elevation of these gauges, when established through water level transfer from similar United States gauges, will prove a check on the work now being done by the precise level party.

For details as to the survey in the Nipissing district, methods of work, &c., refer to district engineer S. J. Chapleau's report in appendix D.

## OTTAWA DISTRICT.

Details as to the progress of the work are given in appendix E. in a report presented by Mr. E. J. Rainboth, the Ottawa district engineer.

This district comprises sections 4, 5 and 6 of the Ottawa river, and extends from the head of Rapid Des Joachims, to the mouth of the Gatineau river, below the Chaudière falls. Including the channels north and south of Allumette islands, the total length of river channels to be surveyed is about 184 miles.

At the end of the fiscal year, work had made fair progress and was being pushed actively.

On section 4, from Des Joachims to Coulonge, about 44 miles of river out of 86 have been completely surveyed, over which levels and soundings have been taken.

Some soundings have also been taken in the lower river stretches of this section, and it is estimated that it will take from 6 to 8 months to complete.

At Des Joachims rapids, it has been decided to carefully develop a short cut from the head to the foot of the rapids through what is known as the McConnell lake valley, which is supposed to have been at one time the old river bed, the latter having a length of about  $4\frac{1}{2}$  miles. Of this, McConnell's lake occupies 2 miles of deep water in length, and an average width of 1,000 feet. The valley above and below the lake connecting with the river is relatively low, and the location seems to be good as to direction and curvature.

This is now being surveyed.

From the rapids down, for a distance of twenty-eight miles, is a magnificent stretch of river called the Deep river, with a good wide channel over 40 feet deep. Below, the river gets shallower and dotted with islands, and then widens into what is known as Upper Allumette lake containing numerous shoals and over 200 islands, with a tortuous channel reaching to the lower narrows.

Below the Allumette lake is Allumette island where the river is divided into two channels, the south or Pembroke channel, and the north or Culbute channel which is about ten miles shorter than the south channel, but is much narrower.

At the end of the fiscal year the survey on that section had reached a point about five miles above Pembroke.

On section 5, which extends from old Fort Coulonge to the Chats rapids, a distance of about fifty-six miles, the work has progressed satisfactorily, but much yet remains to be done, the work being slow on account of many natural difficulties met with. This section will take from six to eight months to complete.

From Fort Coulonge to La Passe near the head of Calumet island, a distance of about five miles, the river or Coulonge lake is divided into numerous channels by about eighteen islands.

From the head of Columet island the river divides into two main channels known as the northern or Calumet channel, and the south or Rocher Fendu channel.

The Calumet channel for a distance of about seventeen miles runs through alluvial deposits and has a depth of from 7 to 25 feet, and an average width of 600 feet, the shallows being silt and sand that can be easily dredged.

On this channel about four miles from the head, the river makes a very sharp bend around a point of the island where a marshy bay called the Grand Marais extends for about a mile in the direction of Coulonge village situated on a narrow neck of land between the Coulonge and Ottawa rivers.

Across that neck as the ground is alluvial and low, a direct route for the canal through the Grand Marais can be obtained about five miles shorter than by following the river which is narrow and tortuous. The length of the cut will probably be less than two miles including Grand Marais. As this location has many good points in its favour, it is now being investigated.

Below Bryson, on the Calumet channel is Calumet falls where the country is again rocky and very difficult.

From the head of these falls to Portage du Fort, the river falls 100 feet in eleven miles, and from Portage du Fort to the Chats, the fall is 16 feet in four and a half miles, the channel being dotted with numerous rocky islands, many of them obstructing possible navigable channels. This is no doubt a most difficult portion of the Ottawa river, as no matter where the canal is finally located either on the north or Calumet channel or through the south or Rocher Fendu, it will prove a very expensive portion of river to improve.

The Rocher Fendu channel passing south of Calumet island is practically navigable from the head of the island for about four miles, after which the river runs through rocks, and is broken up into falls and rapids, and a great number of islands, leaving no definite channels. It has not been decided yet to survey this channel; a decision will be reached only after thorough exploration.

From Portage du Fort to the Chenaux rapids there is a navigable stretch of six miles of over 25 feet in depth with a couple of shoal places.

These are being located.

The Chenaux rapids have only a slight fall of from 1 to 3 feet, according to the stage of the water and immediately below them, the river expands into Chats lake proper, eighteen miles in length and one to two miles wide, with a deep channel. The soundings of this lake still remain to be done.

Section six of the Ottawa district extends from about two miles above the head of the Chats eastward to the mouth of the Gatineau river, a distance of forty-two miles.

The Chats rapids and falls, with a descent of fifty feet, in four miles, and over 300 islands render this, one of the most difficult portions of the river with which we have to deal. The survey of this part is naturally very tedious, as it has to be very complete in order to allow the selection of the most economical and suitable canal location to be made.

Below the Chats, for thirty miles, stretches Lake Deschenes with an average width of one and a half miles and a channel from 19 to 25 feet deep. From Lake Deschenes there are five miles to the foot of the Chaudière, in which the fall is 60 feet.

This part of the river is now being surveyed thoroughly and possible routes, leaving the bed of the river above the Chaudière and joining it again somewhere below, are being investigated in order to avoid if possible disturbing the many power interests situated at the falls. However, the possibility of keeping to the bed of the river is also being looked into.



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The work on this section is well advanced, and it is expected that the field work will be finished in November or December.

For more details as to the work carried on in this district see Appendix E.

## MONTREAL DISTRICT.

(Mr. C. R. Coutlee, in charge.)

This district extends from Ottawa to Montreal, and is also divided into three sections, Nos. 7, 8 and 9.

The survey work on section 7, which extends from the Gatineau river down to Carillon, a distance of about sixty-six miles, has now reached L'Original, fifty odd miles below Ottawa.

This is a very good stretch of river. It is generally wide, but will require heavy dredging at many places for deep navigation.

There seems to be a fall between Ottawa and Grenville of about 8 feet at high water, but at low water stages there is practically no fall.

A special feature on this stretch is the heavy rise of the river in the upper portion, at flood time, caused by the large Gatineau flood which flows in conjunction with the rapid flow at the Chaudière falls, about two and one-half miles above, the Gatineau emptying just above at a contraction in the Ottawa at Rockcliffe. On this account it may be necessary to consider the control of the water flow of the Gatineau river to some extent.

That portion between Grenville and Carillon has not yet been surveyed, and will require careful study; Grenville to Greece Point, nearly six miles, is a continuous rapid. Long Sault, which is surmounted by the Grenville canal, making a rise of 40 odd feet. Grenville to Carillon is a level which was formed by the Carillon dam and which drowned out the Chute à Blondeau rapid.

The Carillon canal is three-quarters of a mile long with two locks, and a total rise of 16 feet.

It is expected that this section down to Carillon will be completed by October next.

*Section No. 8.*

From Carillon down to the foot of Lake of Two Mountains where it empties by four channels, two back of Montreal empties into the St. Lawrence and by the Vaudreuil and St. Anne rapids, into Lake St. Louis.

This section is twenty-six miles long, but an alternative route north of Isle Bizard makes ten miles additional work.

This being practically all lake work, a very large area has to be covered to carry on a complete investigation.

Many low-lying islands and considerable low lands have had to be surveyed as the possibility of raising and maintaining the water levels at a higher stage will have to be considered.

This section is so well advanced that it will probably be completed by the beginning of September. It is the intention to put this party on the Pembroke channel as soon as they are through with No. 8.

*Section No. 9.*

This section embraces surveys along the south or Lake St. Louis side of Montreal island, and also along the north or Back river side. Along the south side it is fifteen miles to Lachine and ten miles thence to Victoria bridge, Montreal. The Back river survey extends from St. Anne to Isle Bizard and down to Bout de L'Ile, a distance of over forty miles.



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All the St. Lawrence side has been surveyed down to Montreal, including a traverse and cross sections along the Lachine canal, and it is probable that the Back river survey will be finished about the beginning of November.

For methods of work, description of work done and other details refer to Appendix F.

#### HYDRAULIC INVESTIGATION.

In Appendix G will be found a detailed statement by Mr. Alexander McDougall, hydraulic engineer, as to the work done up to June 30, in connection with this important part of the investigation relative to the projected canal.

Generally, this investigation consists in collecting all available data referring to the present condition of the established water-power plants as well as all other unused powers on the canal route; to study the regime of the rivers to be canalized and collect the necessary information to strike out the curves of low and high water; to study the probable effects on low stage of the Ottawa river and of impounding surplus water in the spring in the upper reaches of the river; to make a complete study and report with regard to the water supply for canal purposes at the height of land between Lake Nipissing and the head of the Mattawa river, all available sources of water supply being investigated.

The work done so far has been divided into two general divisions: one comprising the water supply for canal purposes at the height of land and vicinity, the other the general study of the Ottawa river and its tributaries.

As this work is still in progress, no figures nor deductions will be given. Those given in Appendix G are only approximate and mentioned only for a better understanding of the question.

In general, the water supply at the height of land is studied for a possible traffic of 10,000,000 to 20,000,000 tons. The investigation so far, though not complete, seems to indicate that the supply from the immediate water shed of Trout, Turtle and Talon lakes at the height of land will not be sufficient for the amount of traffic assumed. But the possibility of getting an extra supply of water from an adjacent water shed and by impounding water is now being looked into with every chance of meeting with favourable conditions.

The quantity of water which is required for canal purposes will necessarily vary with the size of locks which it is decided to adopt, and the amount of traffic and size of vessels, which will be ultimately assumed in relation to the project. However, for the purposes of the investigation, the supply required is considered under six different headings, as follows:—

1. Filling the locks.
2. Leakage of gates.
3. Evaporation and seepage.
4. Leakage over the waste-ways.
5. Power to operate gates.
6. Power for electric lights.

To meet these conditions and for the different purposes above mentioned, no doubt it will be found that over 1,000 cubic feet of water per second is required at the summit.

The study of the run-off in the water shed is rather involved as the lumbermen have built storage dams on most of the lakes, the waters of which they use in the spring and during the summer, to drive logs. These dams are opened and closed many times during the season, and require close watching in order to find out the total run-off from any particular part of the watershed.

For this reason, a very complete system of gauges had to be established on all the lakes of the watershed and daily readings recorded, and the conditions at dams noted, in order that the different flow measurements taken from time to time and their results may be deducted under exactly known conditions.

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Rain fall observations have also been carried on at the same time and some experiments as to the amount of evaporation at the height of land have been made, and are being continued.

Gauges have been placed also at many points on the Ottawa river and tributaries, and systematic measurements commenced in order to collect the necessary information to strike out the curves of discharge of the river. The daily water levels along the route are being noted, and statistics of rain fall, snowfall and evaporation, &c., are being collected.

Special flow measurements of the Ottawa river are being carried on at the following places: at its four branches above Montreal: at Besserer's grove, twelve miles below Ottawa; at La Passe near Coulonge, and at Deux-Rivières below Mattawa, where the proposed canal will join the Ottawa; also on the Mattawa river.

As the tributaries between these different sections are also being measured, it will be easy to determine with sufficient accuracy the quantity of water required at any other section of the river for purposes of regulating works, &c.

For details, methods of work, and tabulated information already collected, refer to Appendix G.

## TEST BORINGS.

As soon as it was possible to indicate some of the places where test borings are required along the route of the proposed canal, three boring parties were organized, one for each district under the direction of Mr. A. R. Dufresne, one of the departmental engineers.

Three Pierce test boring machines were purchased and boring party No. 1 was placed at work at Mattawa at the beginning of May.

Test boring party No. 2 was organized in June and was placed at work in the Montreal district.

Test boring party No. 3 will be placed at work very soon in the Ottawa district.

The material encountered in many cases where borings have been made so far, consisted of closely compacted boulders and gravel, generally overlying fine sand.

This deposit of boulders and gravel is of glacial drift origin, and is characteristic, to a greater or less extent, of the Archaean formation throughout the Nipissing and most of the Ottawa districts.

Considerable trouble, of course, has been experienced in using the boring machines, where this boulder drift is encountered and in many cases the pit method has had to be resorted to, in order to pass through the top layers of boulders and gravel. When this was accomplished, the machine was set up and satisfactory progress was made.

Penetration by means of the Pierce machine, in the underlying strata, is a succession of driving a two-inch casing, and washing out the material inside with 1-inch pipe connected with a force pump.

Mr. Dufresne reports that the use of dynamite has often been resorted to, with considerable success, in connection with the use of the Pierce apparatus, in loosening up compact material, and breaking up occasional boulders obstructing the bore hole.

Samples of the different classes of material encountered are kept in properly labelled bottles, for future reference.

In the Montreal district, the nature of the material was such that no difficulty was experienced and rapid progress has so far been made.

A detailed statement of the borings made up to June 30, with remarks as to the character of material encountered, force employed, and instructions given to assistant engineers in charge of boring parties, &c., is given in Appendix H.

## PRECISE LEVELLING.

This work, which is under the direct charge of Mr. Chas. F. X. Chaloner, who has had a large experience in connection with geodetic levelling, consists as explained

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before in this report, in transferring the mean sea level datum as adopted, by United States engineers, to different points of the proposed canal route, in order that all the elevations on the different sections may be worked or reduced to the same datum.

This work commenced in November, 1904. The American datum was first transferred from the Canadian Pacific railway bridge at Lachine to St. Anne, and then checked from St. Anne to Coteau Landing with the Soulanges canal system of levels based also on the American datum. Then the railway lines were generally followed up, touching the Ottawa river at convenient points, and at the end of June, the party had reached North Bay. As it is very important that this line of precise levels be closed somewhere for check, where the elevation above mean sea level is available as determined by the United States Coast and Geodetic Survey, it is the intention to close this line on the Toronto bench marks, and to push also as far as Collingwood on the Georgian bay in order to obtain a check for the French river levels.

For more details refer to appendix I.

#### CONCLUSION.

The past winter with its extreme conditions of severe frost and heavy snowfall, retarded the survey very materially.

On the lakes and rivers, the waters overflowing the top of the ice formed over a foot of slush under the snow, thus creating the worst conditions possible to take soundings. The constant wind and cold made it very uncomfortable for the men. Moreover the roads to and from the work at the different camps, were almost impassable the whole winter; they had to be opened almost every day on account of constantly drifting snow.

All these causes have contributed to considerably increase the cost of the survey, and to retard the probable time of completion.

Notwithstanding these unfavourable conditions, good substantial progress has been made, and the field force certainly deserve great credit for their efforts in the interest of the work, and the amount of work already performed. It is hoped that most of the survey will be completed late in the fall, excepting on two or three sections, which are longer than the others, and where physical difficulties are such that they may be completed only some time in January or February next.

It is understood also that in 1906, while putting down on paper the final scheme as adopted, it will be necessary to send out one or two parties at different points to supplement the information, if required, where structures, &c., will be located.

I expect that the time necessary for all engineers and draughtsmen, to make all computations, quantities, final plans, &c., will extend over a year after the field work has been completed.

In many places, different possible routes will have to be estimated and compared, and the amount of office work in connection with trial and final lines will be considerable.

Questions involving large and difficult problems have to be looked into very carefully, as in presenting a report on this important project, and arriving at an estimated cost, nothing should be assumed, or left indefinite.

This work, before it can be undertaken as a national enterprise, demands an exhaustive study, and the office work in this connection will be long and tedious, before any final and complete report can be given.

With regard to the field work, reconnaissances by the district engineers and the engineer in charge have been systematically made in order to limit the work as much as possible.

Last winter, I personally examined, at different times, the greater portion of the Nipissing and Montreal districts.

These explorations are being continued with a view of directing the survey, and also to give an opportunity to the district engineers to see the whole route and become familiar with its different features.

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As this is only a progress report, and as the work is not advanced enough to enable me to form any definite opinion, no attempt is made to formulate any statement as to the practicability of the proposed undertaking or its probable cost. Any conclusion that may have been reached now in connection with some of the problems involved, may be materially changed when all the necessary information has been collected.

Before concluding, I wish to express my sincere appreciation to every one connected with the staff for the interest shown in the work, and their devotion to their duties. Men in the field have had a hard task before them, and taking everything into consideration, I believe they have done their best and have done wonderfully well. I must also commend the employees at headquarters for their good will and excellent work.

I have no doubt that the results achieved in the end will prove very satisfactory.

I have the honour to be, sir,

Your obedient servant,

A. ST. LAURENT,  
*Engineer in Charge.*

## APPENDIX B.

## TABLE of Distances of all Water Routes.

## ROUTE VIA GEORGIAN BAY SHIP CANAL.

Via Great Lakes and Georgian Bay Ship Canal to Montreal.	Distance to Montreal.	Montreal to Liverpool via Belle Isle.	Total Distance.
Fort William to Liverpool .....	920	3,189	4,109
Duluth " .....	1,042	3,189	4,231
Milwaukee " .....	892	3,189	4,081
Chicago " .....	958	3,189	4,147

## ROUTE VIA RIVER ST. LAWRENCE CANALS.

Via Great Lakes, Welland and River St. Lawrence Canals to Montreal.	Distance to Montreal.	Montreal to Liverpool via Belle Isle.	Total Distance.
Fort William to Liverpool.....	1,221	3,189	4,410
Duluth " .....	1,343	3,189	4,532
Milwaukee " .....	1,180	3,189	4,369
Chicago " .....	1,245	3,189	4,434

## UNITED STATES ROUTE.

Via Great Lakes, Erie Canal, Hudson River and New York.	Distance to New York.	New York to Liverpool.	Total Distance.
Fort William to Liverpool.....	1,359	3,571	4,930
Duluth " .....	1,481	3,571	5,052
Milwaukee " .....	1,318	3,571	4,889
Chicago " .....	1,384	3,571	4,955

NOTE.—All distances on these tables are given in statute miles.

Fort William to Liverpool via New York .....	4,930 miles.
" " " Georgian Bay Ship Canal .....	4,109 "
Difference in favour of the Georgian Bay Ship Canal Route.....	821 miles.
Fort William to Liverpool via River St. Lawrence Route.....	4,410 "
" " " Georgian Bay Ship Canal Route.....	4,109 "
Difference in favour of the Georgian Bay Ship Canal Route.....	301 miles.
Fort William to Liverpool via New York .....	4,930 "
" " " River St. Lawrence.....	4,410 "
Difference in favour of River St. Lawrence Route.....	520 miles.

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## TABLE of Distances of Water and Railway Routes.

## CANADIAN PACIFIC RAILWAY ROUTE VIA GREAT LAKES, FRENCH RIVER AND MONTREAL.

	Fort William to North Bay.	North Bay to Montreal.	Montreal to Liverpool via Belle Isle.	Total Distance.
Fort William to Liverpool.....	573	364	3,189	4,126
Duluth " .....	695	364	3,189	4,248
Milwaukee " .....	545	364	3,189	4,098
Chicago " .....	611	364	3,189	4,164

## CANADA ATLANTIC RAILWAY ROUTE VIA GREAT LAKES, DEPOT HARBOUR AND MONTREAL.

	Fort William to Depot Harbour.	Depot Harbour to Montreal.	Montreal to Liverpool via Belle Isle.	Total Distance.
Fort William to Liverpool.....	511	379	3,189	4,079
Duluth " .....	632	379	3,189	4,200
Milwaukee " .....	483	379	3,189	4,051
Chicago " .....	549	379	3,189	4,117

## GRAND TRUNK RAILWAY ROUTE VIA GREAT LAKES, MIDLAND AND MONTREAL.

	Fort William to Midland.	Midland to Montreal.	Montreal to Liverpool via Belle Isle.	Total Distance.
Fort William to Liverpool..	538	382	3,189	4,109
Duluth " .....	660	382	3,189	4,231
Milwaukee " .....	509	382	3,189	4,080
Chicago " .....	576	382	3,189	4,147

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MATTAWA, June 30, 1905.

A. ST. LAURENT, Esq., C.E.,  
Engineer-in-Charge, Georgian Bay Ship Canal Survey,  
Ottawa.

Dear Sir,—I beg to submit a report of the work done in the Nipissing district of the Georgian Bay Ship Canal survey to date, June 30, 1905.

This district originally covered that part of the Ottawa and Mattawa rivers that lie between the head of the Des Joachims rapids, which is some forty odd miles above Pembroke, to Lake Nipissing and subsequently it embraced that latter lake.

During the first week of October, 1904, the organization of the survey was completed and the original Nipissing district divided into three sections, the parties placed immediately at work thereon, being fully equipped by the department with all necessary instruments, stationery, &c., for the determination and record of the work and the initial necessary supplies, with blankets, camp equipment, boats, canoes, &c.

Section No. 1, embraces that part of the country lying between Lake Nipissing the head of the Des Joachims rapids, in all about 53 miles direct distance.

Section No. 2, has all locations between the Talon Chute, its vicinity, and the head of Johnson's rapids, about one mile below the town of Mattawa, in all about eighteen miles of direct distance.

Section No. 3, embraces that part of the Ottawa river from Johnson's rapids to the head of the Des Joachims rapids, in all about fifty miles direct distance.

The subsequent section which was allotted to the district and called the lake party, or section O, was given the investigation of that part of Lake Nipissing which lies between North Bay and Vases creek, on the north-east shore of the lake, across Frank's bay or the upper entrance of the French river.

After a careful investigation of all the available plans and profiles of previous surveys, it was determined to obtain topography to the highest possible contour of all flooded area that would of necessity follow the erection of dams and other regulating works. With this end in view a raised water surface profile was adopted with a summit level embracing, Trout, Turtle and Talon lakes, all to the Trout lake level, and between the lower end of the last named lake to the adopted raised level of the pool at the head of the Des Joachims rapid. The limit of the flooded contour to be carried, was adopted to embrace any probable crests that might be projected in final design for the control of the different pools.

All investigated areas were covered by accurate triangulation or closed traverse or both as a basic net upon which the topography soundings and other detailed information would subsequently be hung.

Base lines incorporated in the above at intervals of not more than 8 miles apart were carefully measured by steel tapes with spring balance and thermometers—tapes previously tested for temperatures and tension—the line levelled, reduced to the horizontal and correction for tape error applied for, &c.

Error between carried and calculated bases measured to date less than 1 in 2,600.

Meridian established by observation on Polaris or some other circumpolar star at elongation taken at similar intervals of not more than 8 miles apart, and from base-line or main transit line points.

True azimuth carried throughout the basic net for closure with adjustment of error of carried and observed azimuth, after correction for convergence of meridians, &c.

Completed main circuit closed-traverse close to within 1 in 750.

Connecting triangulation stations customary method of traverse used, starting from a triangulation station with known azimuth to another visible triangulation station meandering for positions required and the circuit closed by Stadia or chainage on next main station.



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Closures of these lines by latitudes and departures with co-ordinate difference of the main stations affords the required check.

Shore line stations serve to unite topography and hydrography, while cross-river sights served to further connect the work.

Transits reading to 30 seconds with vertical arc reading to single minutes used in main traverse and triangulation.

Check levels were carefully carried early in the survey over the summit sections, sections Nos. 1 and 2 in duplicate lines from the assumed elevations of permanent benches at each end of each section and of which the precise level party, now on its way from Montreal to North Bay, will determine the true elevation.

Both these level loops checked to within .02 V. distance in miles between B.M.'s.

The level used in the above work was a 24-inch Gurley 'Y' with 6 second vial reading target rods of the U.S. coast and geodetic pattern reading to thousandths.

The general topography, owing to the extreme roughness and underbrush of the country, was carried on by means of hand level rods and tapes with angle mirror, or box sextant, for direction, except in those cases where possible structures might be located, which were more closely cross sectioned by 'Y' level and transit.

In numerous cases where the shores are very precipitous and confine long stretches of the river, either a limiting contour traverse line was run, or the slope, if it were a quick one, was determined roughly by estimation from shore stations.

It was found impracticable on account of the nature of the country to use the stadia for elevation topography, but was largely used in shore traverse and in mapping general locations where obstructions would not retard the method.

Particular localities where required were covered so as to enable them to be developed in 2 and 5 foot contours.

The major part of the soundings were made from the ice; a boring machine consisting of an auger, geared to a hand wheel mounted on a sled and capable of drilling a 4-inch hole through 36 inches of ice, was used for this purpose.

The layout was defined by the depth which was being found, reference being made to the elevation of the proposed water level—these layouts were either in squares or parallelograms, and varied from 25 to 500 feet each way.

Recourse has also been had to boat soundings and the use of the sweep bar.

Information as to nature of material worked over, independent of the special party arranged for that purpose, has been carefully noted in all cases. Also the nearby location of such material as would prove valuable in construction.

Measurement of the discharge and the record of the water levels at the critical points of each section have been carefully made and will be compiled when time will permit. These were taken irrespective of any similar work done by the hydraulic party.

Plotting the work as it progressed has been carried on not with the idea that it was final, but more to be careful that any area or location under consideration received the full investigation necessary and in proving the closures of the triangulation and traverse systems. These plans which have generally been compiled by the field staff, have been plotted to scale 400 feet 1 inch and even larger at some points.

Borings have been made, where possible, by each section with the jump bar and will continue except in those localities that are being covered by the boring party specially.

With regard to the boring party, instructions have been given to the sectional engineer in charge to prepare plans showing carefully thereon the locations and number of borings desired over any particular locality, for the use of the engineer of the boring party and his assistants.

The immediate object of the survey kept in view has been that the notes being reduced and plotted, there may then be projected upon the maps the location, for any sized canal to a depth of 24 feet draft having bottom width of 300 feet, from which profiles may be drawn and a correct estimate made of the amount and character of

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material in excavation and embankment, nature of various foundations and final design of lock, dams, regulating works, power plants and other structures; also the right of way and definition of flooded area. On locations where curvature will exist, the contours have been sufficiently established to cover any possible increase in the bottom width of prism hereafter to be established to include a curve of 6°.

Where two or three possible routes have been found by investigation, through reconnaissance and track traverse, comparative profiles have been obtained by transit and level, and their centre line section areas computed to grade for comparison. This has led to the investigation of different locations between two points and has proven valuable in eliminating routes that for the time looked promising.

Section No. 1 completed the triangulation, closed traverse and soundings between Lake Nipissing to and including that part of Talon lake known as Black bay, with the exception of some soundings at the Stepping Stones and the rapids immediately below it. Also excepting some soundings on the rapids in the Mattawa river between Turtle and Talon lakes.

The topography has been completed between Lake Nipissing and the foot of Turtle lake, together with the greater part of the Mattawa river below Turtle lake.

The remaining topography to be done on this section as originally allotted lies between Turtle lake, Pine lake and Talon lake, in all about one month's work.

Five traverses have been made from Lake Nipissing to Trout lake with levels and sufficient topography to determine the best route through that divide, two by the Chippewa, two through the Ojibawaysippe route, and one at the Vase.

The upper end of the Ojibawaysippe route used in conjunction with another investigation through Jennings' lake and coming out into Lake Nipissing at Rocky Point, proved to be so far superior to any of the others that this line was determined upon, all soundings and topography completed between Trout lake and Rocky Point, for a close estimate.

Three routes are now under investigation; from Turtle lake to Talon lake; one by way of the Mattawa river, one from Turtle into Pine lake crossing into Black bay of Talon lake and one from Turtle into Pine lake and continuing from the western end of the latter to an arm of the south shore of Talon lake, known as Spottswood bay, and as above stated, will be completed in about a month's time. A route has been under investigation by track traverse from Turtle lake into the Kai-Bus-Kong through Price, Cross and Frog lakes and two pools above the lower rapids of the Kai-Bus-Kong. The lake party will be placed here on completion of the work they now have in hand, that of determining the 5 and 10 foot contours above high water Lake Nipissing, between the town of North Bay and Rivière de Vase.

A suggested route from Lake Nipissing to Lake Nosbonsing and down the Kai-Bus-Kong is out of the question for the reason that Lake Nosbonsing has an elevation of 137 feet above Lake Nipissing, whereas Trout lake has a summit that has an elevation of but 22 feet over Lake Nipissing. Section No. 1 has moved to the Talon lake level and together with the lake party will proceed to complete all surveys above the Talon chute, in addition to their original allotment. It is estimated that this will be accomplished by the last week in August.

This latter work will also include a survey of the Kai-Bus-Kong to above the dam and to the south of the railway at the eastern part of Lake Nipissing.

The above finished work includes about forty-four miles of closed traverses. This is exclusive of traverse for shore delineation, islands, &c.; over sixteen lineal miles of direct triangulation varying in width from one and a half miles to a few hundred feet; about thirty-four miles of direct levelling which includes loops and twenty-four miles of broken water transfer and about 5.25 square miles in area covered by soundings.

Gauges have been established at North Bay, both ends of Trout lake, Turtle lake and both ends of Talon lake, their zeros referred to permanent B. Ms., their record continually kept, and all connected to the level net of the section.

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For the work above Talon chute a launch has been supplied to this party to facilitate the work.

Section No. 2 completed the triangulation and closed traverses between the Johnson's rapids on the Ottawa river and the foot of Talon lake along the Mattawa river. Also the Amable du Fond in closed traverse to Eau Claire.

Four closed traverses have also been made upon which to base the topography laying directly between Sand bay on Talon lake, and that part of the Mattawa river immediately below the Paresseux falls. Soundings have been completed from Johnson's rapids on the Ottawa river to the Paresseux falls on the Mattawa river, with the exception of about two days work in the vicinity of the town of Mattawa.

All topography has been completed between the two points, except the Sand bay Paresseux line and the possible flooded contours followed up the Amable du Fond and vicinity.

Benches at the head and foot of each break in the natural profile were early established, and their height above the W. S. noted; and soundings reduced therefrom. These benches were subsequently embraced in the level net.

There are three possible routes between the Talon lake level and Lake Champlain. One from Sand bay to the Paresseux falls, one following the natural line of the Mattawa river, and the third passing by Talon chute to the lower end of the Pimisi lake, thence across to Johnson's lake, Smith's lake, Crook's lake, Moore lake, two ponds, and running into the Champlain lake through a blind arm located at its western end.

A careful reconnaissance of that part between Sand bay and Paresseux falls has proved that a location may be found through there with a curvature of not more than 2°, and this location is now being close contoured. The topography of the all river route will not be undertaken between Pimisi lake and Paresseux falls, except for the determination of raised water level contour; until after the finished investigation of the first and last route; for the reason that the latter two are much straighter and shorter, while the river route contains two changes of direction of 90°, each within a short distance, and which occur in close proximity to possible lock structures on such a route.

Several reconnaissances and track surveys have been made on the line from Pimisi lake through Johnson and Smith lakes, to Champlain lake; these show that the line may be carried here at the expense of very little excavation, the level maintained principally by banks; thus getting rid of the extremely heavy rock work necessary between Sand bay and the foot of the Epines rapid along the first route. This would necessitate a diversion of the main line of the Canadian Pacific Railway, in order to prevent two crossings, and which the reconnaissance shows can be accomplished by an easier grade and straighter alignment than now exists.

This route will be thoroughly investigated.

The above finished work includes about 33 miles of closed traverse, 9 miles of direct triangulation. Over 45 miles of looped and 11 miles of direct levelling; about 15 lineal miles of river covered by close soundings. Not even a reasonable approximation can be made at present of area covered by triangulation or soundings.

It is estimated that it will take this party until some time in December next to cover the remaining work to be done on this section. The country immediately to the east of the lower end of Talon lake is exceptionally rough and very thickly wooded; in consequence of which the topography necessary for the estimate can only be obtained very slowly.

On section No. 3 the triangulation, closed traverse, soundings and topography have been completed from Mattawa to nearly the foot of Deux Rivières rapid and close closed levels between Mattawa and the Rocher Capitaine.

Advantage has been taken along this route of the Canadian Pacific Railway line of levels and offset lines have been run from the Canadian Pacific Railway benches to permanent benches established along the line of the river; the Canadian Pacific Railway benches will be covered by the Precise Party now in the field between Montreal and North Bay.

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Reconnaissance of the different rapid currents, of the Klock, Deux Rivières, and Rocher Capitaine rapids have sufficed to show that one continuous location can be made, and topography confined to that line.

Water level gauges have been established along the whole section and their records are still being maintained. One gauging of the discharge was carefully made during high water by the hydraulic party with the assistance of section No. 3 and at a point lying between Klock and Deux Rivières.

In all, the above includes about 54 miles of closed traverse, and 54 miles of direct levels. About 70 miles of offset levels from C.P.R. B. Ms. to water to establish datum water levels for soundings, &c. Area includes about 12 square miles under triangulation, and the same covered by soundings. A launch has been allotted this party in order to facilitate the work; and it is expected that this section will be completed early in December.

During December, 1904, this district was directed to obtain all soundings between the north-east shore of Lake Nipissing contained in that part from the town of North Bay to East bay and Frank's bay at the entrance of the French river. This was in order to connect with the surveys made in 1901 under the direction of the late Mr. J. W. Fraser. For this purpose a separate party was organized, and in order to carry out the work; four houses, 8 feet by 20 feet, were built and placed on runners for their accommodation.

A base line seven miles long was run from a permanent point on the shore west of North Bay to another permanent point below the Vase river near East bay, the shore traversed and connection made with the permanent points of section No. 1. This line is also proposed to be used later in triangulating the lake prior to an investigation of the elevations of its shore contour. Work was begun early in January and the soundings completed before the ice made it unsafe for this work.

Two routes were investigated; one to the north and one to the south of the Manitou islands. Each one of these bands of soundings varied between 4,000 and 5,000 feet in width. The bottom of the lake drops very gradually from the North Bay shore, and necessitated the soundings in that vicinity to be taken very closely.

Once deep water was established, it continued to the mouth of the French river with the exception of different shallow soundings, which when encountered were closely investigated.

On the completion of this work this party was detailed to establish the 5 foot and 10 foot contours above the high water plane of Lake Nipissing, from west of the town of North Bay to Rivière de Vase. And they are now engaged on this work.

Upon its completion they will be placed as above stated, on the inspection of the route between the Kai-Bus-Kong and Turtle lake, on section No. 1.

Gauges have been established at North Bay and across the lake and at Frank's bay and to which the soundings of the lake party are referred. Water level transfer between these gauges has established the elevation of the Frank's bay B.M. to the adopted datum of section No. 1.

This section completed about thirty-six miles in area of soundings, about forty-two miles of traverse, and to date about twelve miles of completed contour.

In view of the work now being done by the Precise Level party in carrying a line from the established Rouses' Point and Coteau Landing, B.Ms. through to North Bay along the line of the Canadian Pacific Railway system, to the datum of mean sea level, at Governor's island, New York (to which all hydrography on the upper lakes charts are reduced) automatic gauges have been placed at Toronto, Collingwood and foot of the French river, and their zeros connected to permanent B.Ms. in their immediate vicinity.

The elevation of the zeros of these gauges when established through water level transfer from similar United States gauges, will prove as a check to the work now being done by the Precise Level party. To accomplish this, however, it will be necessary to carry a line of levels down the French river, make the water level transfer

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from French river to Collingwood, and have a precise line of levels run from Collingwood to the department's bench at Toronto.

The expense incurred by the maintenance of the Nipissing district, exclusive of the original field equipment, original supplies and instruments furnished by the department, &c., and the expense of the district engineer's office, amounts to \$57,342.

This includes articles of food, general camp equipment, instruments, furniture, fuel, light, rent, salaries, travelling expenses, horses, miscellaneous.

While at the present stage of the work and the uncompleted details of the plotting, it is impossible to give the cost of survey per square mile.

To those, however, who are acquainted with the localities in question, either by observation, or a study of existing maps, it may be stated that the cost per lineal mile of completed survey amounts to approximately \$630; it must be remembered, however, that this includes a distance on each side of centre line of route varying from 300 feet to several thousand feet.

After careful investigation it has been found that the cost of sustenance of the field parties of the Nipissing district has averaged about \$14 per man per month.

The value of the work done, or the personnel of the different staffs must not be judged from the above estimate of distance and area covered by the different sections, as the physical conditions of allotted country have not been the same in all cases.

Inspections have been made during the progress of the work which was found at all times to be carried along with much vigour and interest.

It is gratifying to state here that it gives me much pleasure to thank the different sectional engineers, and their immediate staffs, for their patience, energy, and hearty co-operation, in endeavouring to make the survey the success that is so much desired.

I have the honour to remain, sir,

Your respectfully obedient servant,

(Sgd.) S. J. CHAPLEAU, M.Am. Soc. C.E.

*Engineer, Nipissing District.*

P.S.—Diagram plans of each section attached. (Sdg.) S. J. Chapleau.

## DEPARTMENT OF PUBLIC WORKS OF CANADA,

## GEORGIAN BAY SHIP CANAL SURVEY,

OTTAWA, July 29, 1905

SIR,—I have the honour to submit the following report of the survey of sections 4, 5 and 6, forming the Ottawa district of the Georgian bay ship canal, of which I have charge, dating from the commencement of this work on September 27 to June 30 last.

Section 4 extends from a point about two miles above the head of the Portage at the Des Joachims rapids, on the Ottawa river, eastward to Fort Coulonge, including the channels north and south of Allumette island, comprising 86 miles of river channel.

Of this, 44 miles have been surveyed in eleven circuits by triangulation and shore traverse, over which the levels and soundings were taken, each circuit closing and checking on itself; on five of these circuits no triangulation was made and some work remains to be done at Des Joachims rapids on the first circuit, which had been discontinued in order to avail ourselves of the winter season to carry the survey over the ice farther down stream.

The first of these circuits covers from west end of section to the foot of Des Joachims rapids, including the river valley and McConnell lake valley, which is supposed

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to have been at one time the old river bed—the latter has a length of about  $4\frac{1}{2}$  miles. Of this, the lake occupies 2 miles of deep water and an average width of 1,000 feet. The valley from upper end of lake westwards to river is 5,200 feet in length, 5 feet above the river, with the lake 14 feet below river at head and 15 feet fall from lake, 3,000 feet to Colton's bay on river at foot of rapids. In Mr. Shanley's report this valley has been favourably mentioned as a possible route for the canal, the location being good as to direction and curvature, but the excavation would amount to about 700,000 cubic yards per 100 foot width with two locks, one above and the other below lake, how much of this excavation would be rock remains to be seen from test borings that are now being made there.

The route by the river would no doubt require less excavation, but the curvature is bad owing to two abrupt bends in the river.

From the rapids down, a distance of 28 miles is a magnificent stretch of river commonly known as Deep river, with a good wide channel over 40 feet deep in a direct course, except the last circuit where the river turns abruptly to the south; for the next two circuits the river widens into what is known as Upper Allumette lake containing numerous shoals and over 200 islands, with a tortuous channel to the lower narrows. The survey has now reached this point about five miles above Pembroke on the south or Allumette lake channel.

Allumette island, dividing the river here into two channels, is 14 miles long and has an average width of five miles—the north or Calumet channel although some ten miles the shorter, is rather narrow in places and contains less than one fourth the flow or discharge of the south or Allumette lake channel.

The amount of work done on this section to June 30, is as follows:—

- 28 miles of river triangulated with 137 stations.
- 117 miles of transit and chain shore traverse.
- 101 miles of levels taken.
- 65 miles of contours.
- 20 miles of stadia.
- 62 islands surveyed.
- 32,637 soundings taken and recorded.
- 32 miles of river plotted from field notes.
- 6 astronomical observations taken.
- 8 gauges set and daily record kept.

There remain to be surveyed on this section 42 miles of river channel taking in both sides of Allumette island, which the sectional engineer estimates will take six months to complete, including one month for Des Joachims rapids.

Section 5 extends from old Fort Colonge along the north or Calumet channel eastwards to a point on Chats lake about two miles above the Chats rapids, a total distance of about 56 miles.

A triangulation and shore traverse has been carried down stream to the Sables within 5 miles of Portage du Fort, over which the levels have also been taken and soundings completed from Lapasse to the Mountain chute.

From Portage du Fort to the foot of the Chenaux rapids, including the different channels at the latter place, a transit and chain traverse survey was carried over the ice with levels and soundings; from the Chenaux rapids to the east end of section above the Chats rapids a transit and chain traverse was carried down on the Ontario shore with levels. Triangulation stations on both shores were connected with this traverse from Portage to east end of section, but the angular measurements remain to be taken.

From Fort Coulonge above the mouth of the Coulonge river to Lapasse near the head of Calumet island a distance of about five miles, the river or Coulonge lake is divided into numerous channels by about eighteen islands. This part is now being surveyed.



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From the head of Calumet island to the Calumet falls on the northern or Calumet channel, a distance of seventeen miles, the river is navigable, having an average width of 600 feet and a channel of from seven to twenty-five feet in depth, the shallows being of silt and sand that can be easily dredged.

The Rocher Fendu or south channel of Calumet island is navigable from the head of the island for about four miles, after which for eight miles the river is broken for half that distance into falls, rapids and a great number of islands, then to lower end of island is the Rocher Fendu lake four miles long, half a mile wide and twenty-five feet in depth. The total length of this channel is sixteen miles or six miles shorter than the north or Calumet channel.

On the Calumet channel, four miles from the head, the river makes a sharp bend around a point of the island where a marshy bay called the Grand Marais extends for about a mile in the direction of Coulonge village, situated on a narrow neck of land between the Coulonge and Ottawa rivers; from the Grand Marais a canal can be cut through low ground north of the village to the Ottawa river between old Fort Coulonge and the mouth of the Coulonge river, for a distance of about three miles, making a direct route of about four miles in length, whereas by the river, the distance is about nine miles and tortuous. Last winter a survey was made of this route from Grand Marais to Coulonge village, this survey is now being extended to near the old Fort and test borings will be made, but no rock is likely to be met with.

At Calumet falls a survey was made of the timber slide channel and another of a gully or ravine on Calumet island for about a mile in length past these falls; the location of the latter is favourable as regards direction and curvature but would require an excavation of about 900,000 cubic yards per 100 foot width, mostly rock.

From the head of Calumet falls to Portage du Fort the river falls 100 feet in eleven miles, distributed as follows: Calumet falls and rapids, 60 feet, Létargie rapids, 6 feet; Mountain chute, 14 feet; Sable rapid, 4 feet. On this portion of river from the head of Calumet falls to the foot of Calumet island there are 18 islands; below this to Portage du Fort the fall is 16 feet in four and a half miles with over eighty islands, some of the largest being over 100 acres in extent.

This is no doubt the most difficult portion on the Ottawa river, and has already in the past given rise to differences of opinion. Mr. W. Shanly in 1857 choosing the Calumet channel as the best route and Mr. T. C. Clarke in 1860 favouring the Rocher Fendu channel.

As the instructions did not call for a survey of the latter, no work has been done there, but it might prove the better route for a 22 foot navigation, owing to the narrow channel by the Calumet and the continual dredging that will be required there on account of the deposits of sand carried down annually from the upper and northern end of Calumet island by the spring freshets.

From Portage du Fort to the Chenaux rapids there is a navigable stretch of six miles of over 25 feet in depth with a couple of shoal places of 9 feet depth. The fall at the Chenaux rapids in low water is less than a foot and steamers pass it without difficulty but in high water the fall is between three and four feet, the greater flow being restricted by the reef and a group of islands; by enlarging the channels between the islands with a dam at the Chats the obstruction here can be overcome.

Below the Chenaux rapids the river expands into Chats lake proper for eighteen miles in length and one to two miles wide, with a wide deep channel—the soundings of this lake still remain to be taken.

The amount of work done on this section to June 30 is as follows:—

Twenty-two miles of river triangulated with 180 stations.

Seventy-seven miles of transit and chain traverse.

Sixty-eight miles of levels taken.

Twenty-five miles of contours measured.

Twenty-three thousand nine hundred and sixty soundings taken and reported.

Twenty-one miles of river plotted from field notes.



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Four astronomical observations taken.

Five gauges set and daily record kept.

As the horses and equipment were sold on the other sections, I have deducted the amount that would be realized from the sale of same on this section.

On this section there remain to survey five miles of river between Napanee and Fort Coulonge, with shore traverse, levels, contours and soundings including a group of about thirteen islands; then the survey of the river from Mountain chute to Portage du Fort about six miles, shore traverse, levels, contours and soundings, including about eighty-eight islands; a shore traverse from Portage du Fort to the Chenaux, this part has already been sounded and levels taken; a traverse of the Quebec shore from the Chenaux to east end of section near the Chats and the river channel sounded over the same stretch.

This ought to be completed in six months. Should a survey of the Rocher Fendu channel be made it would occupy another three months.

Section 6. Extends from about two miles above the head of the Chats eastwards to the mouth of the Gatineau river, a distance of forty-two miles.

The Chats rapids and falls, with a descent of fifty feet in four miles and over 300 islands render this one of the most difficult portions of the river with which we have to deal. The survey of this part is now being completed and three routes will be located, one on either side and another by the main river channel.

Below the Chats for thirty miles stretches Lake Deschenes with an average width of one and a half miles and a channel from 19 to 25 feet deep. From Lake Deschenes there are five miles to the foot of the Chaudiere, in which the fall is 60 feet divided as follows: Deschenes rapids, 9 feet; Remix rapids, 3 feet; Chaudiere rapids, 8 feet, and Chaudiere falls, 40 feet.

Of the several routes that have been projected, that along the Ontario shore and the square timber slide channel appears to be the most suitable, but this spring a survey was made of an entirely new location, to the rear of Hull city, from the head of the Remix to the outlet of Brewery creek near the mouth of the Gatineau; the distance is about three miles and would require an excavation of two million cubic yards per 100-foot width; Deschenes lake level could be carried through by this route with an additional length of two miles and excavation of one quarter million cubic yards per 100-foot width. Although the excavation on this new route would be costly, it has an advantage as to distance and curvature, avoiding any interference with existing water powers, some of which have been developed at considerable cost.

The survey of this section was started at the Chats and carried down stream to the east end of section by a complete triangulation, a shore traverse throughout of the Quebec side and on the Ontario shore, twelve miles at the west end and seven miles at the east end, levels have been taken over the entire distance, also soundings from the Chats to one and a half miles below Deschenes lake and from the Alexandra bridge to the Gatineau.

The amount of work done on this section to June 30 is as follows:—

- 41 miles of river triangulation.
- 1,649 triangulation angles taken.
- 101 miles of transit and chain traverse.
- 103 miles of levels taken.
- 17 miles of contours.
- 105 islands at Chats by stadia.
- 38.5 miles of river sounded.
- 48,092 soundings taken and recorded.
- 41 miles of river plotted from field notes.
- Plan and profile of location from Remix to Brewery creek outlet.
- 2 astronomical observations taken.
- 9 gauges set and daily record kept.

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There remains to be completed on this section about one half the survey of the Chats, the lower two miles of Chats lake, from west end of section to head of rapids, 24 miles of shore traverse on the Ontario side of Lake Deschênes, shore contours throughout, also the soundings from Remix to Alexandria bridge and for two miles on Chats lake.

The completion of this, the engineer in charge of section estimates, will take about four months.

The past winter with its extreme conditions of severe frost and heavy snow fall, retarded the survey very materially.

The early thaws in March, this year, with colder weather in April, resulted in the spring flood being less high than usual.

In former years the Ottawa river was subject to two distinct floods each spring, the local flood and the north water flood; an occasional year the latter caught the former causing the river to break its bounds in some places, the most remarkable instance of this was in 1876, such years generally resulted in extreme low water in the autumn. Of late years the north water flood has not been so marked, in fact, it is hardly noticeable, owing no doubt to the lumbering operations having been extended farther north, with the construction of dams holding the upper waters in reserve.

By measurements of Mr. Alex. McDougall, hydraulic engineer on this survey, the discharge of the Calumet channel on May 12 was 2,673 cubic feet per second, and of the main river at Lapasse on May 15, 60,600 cubic feet per second, also of the latter at same place on June 28, 43,957 cubic feet per second.

From the east end of this district upwards the drainage area of the Ottawa river is approximately, including the Gatineau, 47,000 square miles, divided as follows:—

QUEBEC SIDE.		ONTARIO SIDE.	
	Square miles.		Square miles.
Gatineau.. . . . .	9,600	Rideau.. . . . .	11,000
Quio.. . . . .	4,700	Mississipi.. . . . .	
Black.. . . . .		Madawaska.. . . . .	
Coulonge.. . . . .		Bonnechère.. . . . .	
Schwyau.. . . . .		Indian.. . . . .	
Dumoine.. . . . .	1,700	Petewawa.. . . . .	1,300
Magnasippi.. . . . .	800	Chalk.. . . . .	
Antoine.. . . . .		Above des Joachims to and including the	
Snake.. . . . .		Mattawa.. . . . .	
Beauchêne.. . . . .	2,200	Above Mattawa to height of land and interpro- vincial boundary.. . .	6,000
Kepewa.. . . . .	9,700	Total.. . . . .	18,300
Upper Ottawa north of Keepawa to heighth of land and west to inter provincial boundary..			
Total.. . . . .	28,700		
Quebec side.. . . . .		28,700 square miles.	
Ontario side.. . . . .		18,300 " "	
Grand total.. . . . .		47,000 " "	

The above shows the greater drainage area on the Quebec side, where the precipitation is also greater in proportion.

About the latter end of September would be the proper time to measure the minimum discharge for navigation.

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The latter measured, some years ago, amounted to 25,000 cubic feet per second near the middle of the district, and after allowing for lockage and overflow at dams, over 300,000 horse power could be developed in this district.

Respectfully submitted,

I have the honour to be, sir,

(Sgd.) E. J. RAINBOTH,

*District Engineer.*

A. ST. LAURENT, Esq., C.E.,

Engineer in Charge,

Georgian Bay Ship Canal Survey,

Ottawa, Ont.

July 12, 1905.

A. ST. LAURENT, Esq., C.E.,

Engineer in Charge,

Ottawa.

Sir,—I have the honour to report regarding the progress of the work on the Montreal district as follows:—

#### SECTION NO. 7.

This section extends down the river from Gatineau Point. It is practically all one level above sea for fifty-six miles to Grenville, and its surface might be maintained at el. 135 above sea without great injury.

Between Rockliffe and Gatineau Point the river is only 800 feet wide, but the depth is over 60 feet. The Gatineau flows in just above this contraction, and in conjunction with the rapid flow at Chaudiere Falls two and a half miles above has raised the surface as high as el. 152. The lowest recorded elevation has been el. 128. Were the river drained down to the bottom level for the proposed navigation there would still be a succession of long lakes. For the most part the improvement will consist in dredging channels only from 2 feet to 10 feet in depth between these submerged lakes.

The survey work on this section has now reached L'Original, fifty odd miles below Ottawa.

Mr. Perreault reports under date July 5, in substance as follows:—

The traverse along the north shore extends from the Gatineau bridge, fifty-four miles down to Calumet. Secondary base lines have been run on the south shore mile 0 to mile 2 and also between mile 50 and 54. The balance of the south shore has been established by triangulation.

Levels have been run down the north shore to Calumet and checked into Chalonier's line at Caledonia Springs. Contours have been taken all along the shores and water gauges were placed last spring at various wharfs and readings are being kept.

Soundings 100 feet apart on lines spaced 250 feet in length of river were taken through the ice for forty-six miles down from Gatineau Point during the winter and after the break up of the ice and high water this work was resumed June 13 and has since been extended to mile 52. In all 25,000 soundings have been taken.

Office work has consisted in reducing field notes and plotting. The plans will contain about 26 miles of river on each sheet.

This section No. 7 continues from Grenville to Carillon but so far it has not been covered by survey. Grenville to Greece Point, nearly six miles, is a continuous

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rapid, the Long Sault. Greece Point to Carillon, six miles, is a level formed by the Carillon dam which drowned out the Chute à Blondeau rapid. This reach might possibly be maintained at el. 105 above sea.

To complete section No. 7 requires five miles of river sounding above Grenville and five miles more between Greece Point and Carillon, besides which 6 miles in the Long Sault rapid would have to be examined for depth. Soundings through the rapid cannot well be taken in regular cross-sections, but it is expected the general depth can be got with fair accuracy. In all, then, 16 miles of river have yet to be surveyed and sounded.

## SECTION NO. 8.

This section extends from Carillon down to the foot of Lake of Two Mountains where it empties out by four channels, two back of Montreal, and by the Vaudreuil and by St. Anne rapids into lake St. Louis.

Mr. McNaughten reports under date June 29 in substance as follows:

Section 8 from Carillon to St. Anne is twenty-six miles long, but an alternative route north of Isle Bizard makes ten miles additional work. The north and south shores of the river were covered by survey till December 12 when all work was concentrated on sounding through the ice, which continued to March 18, when St. Anne was reached.

From Carillon to Rigaud Bay, five miles, the river is one-half mile wide and the soundings extend from shore to shore. From north of Jones Island to St. Anne a width of 1,500 feet was sounded, and an alternative line of the same width was examined south of Jones Island. In all 32,280 soundings were taken in 75 days, average 430 per day.

In April and May, the shore survey was resumed and completed to St. Anne. The numerous islands between Vaudreuil and St. Anne being located by triangulation. In all sixty-five miles of shore were covered, thirty-seven on south side, to St. Anne, and twenty-eight on north side to Oka.

Bench marks have been established on both shores and the levels thoroughly checked. High water (80.5) has been traced on both shores and simultaneous gauge readings taken June 8 at Carillon gave 73.95; Hudson 73.65; St. Anne 73.50, showing 0.45 feet fall in river surface, distance twenty-six miles.

If water surface Carillon to St. Anne were kept el. 75 no levees whatever would be required, whereas el. 81 would inundate Vaudreuil, Oka and other places.

Pit sand is found at Hudson and Oka and is also pumped from the bed of the river and near St. Joseph du Lac. The shores of Lake of Two Mountains are lined with boulders which protect them against the frequently recurring storm waves, along this stretch.

Office work has consisted in reducing notes and a large plan is well under way, in fact completed with soundings and levels shown from Carillon to Pointe aux Anglais.

There still remains to be done on section 8, ten miles of sounding from Oka toward St. Eustache, and about twenty miles of shore traverse. The North river will be examined up to the town of St. Andrews, where there is a water power dam.

Considering for the time being that water surface, Carillon to St. Anne, can be held el. 75, the chief engineering question is the regulation of that level by dams and sluices at St. Anne, Vaudreuil, and the head of the two back channels.

## SECTION NO. 9.

This section embraces surveys along the south or Lake St. Louis side of Montreal Island, and also along the north or Back river side. Along the south side it is fifteen miles to Lachine, and ten miles thence to Victoria Bridge, Montreal.

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The Back river survey will extend from St. Anne to Isle Bizard and down to Bout de l'Isle. All the St. Lawrence side has been surveyed down to Montreal, including a traverse and cross-sections along the Lachine Canal. Mr. Voligny's report under date June 19 is in substance as follows :

Lake St. Louis, north shore Isle Perrot and islands from St. Anne to Lachine traversed, levelled, and contoured. Belt 2,000 feet wide sounded from St. Anne to Dorval in lines 100 feet along stream and 50 feet intervals across.

North shore of St. Lawrence river traversed, levelled and contoured from Lachine to Victoria bridge, including Nuns island and Ile Heron at Verdun. Soundings from Verdun to Victoria bridge 200 feet along stream and 100 feet apart over whole north half of the river.

Lachine canal traversed and cross-sectioned every 400 feet from Lachine to St. Paul, and thence down to St. Lawrence river at Verdun.

The shore of Lake of Two Mountains traversed and contoured from St. Anne to Ile Bizard, and thence down Rivière des Prairies to Cartierville. Soundings have been taken from head of Ile Bizard ten miles down Rivière des Prairies.

During the winter 28,595 soundings were taken and since spring about 7,000 more, in all over 35,000. The traverse lines run amount, in all, to 130 miles on this section, and some 46 miles of levelling has been done. A system of triangulation has been made tying in all the work on Lake St. Louis.

The system of work has been to examine about five miles of river, establish camp and place a traverse party on each shore, meanwhile levels are carried along and benches set from which the contours are made. Gauges are put in, and after the circuits are closed and plotted, ranges are established and the soundings taken.

Any south side route means crossing the Canadian Pacific and Grand Trunk railway lines at St. Anne's and at the Caughnawaga and Victoria bridges, both of which carry a heavy and increasing traffic.

Another method of passing from Lachine to Montreal would be by a dam and lock in the Lachine rapids at Heron island.

This would be a bold undertaking, but the proposition was spoken of in 1893. Such a scheme would secure broad river navigation direct into Montreal harbour instead of through eight or ten miles of restricted channel with several locks. It would also afford a splendid water power within five miles of Montreal and the floods from which that city now suffers would be practically done away with. The harbour level would be lowered and other disadvantages might be cited, but for all time a system of improvement would be indicated to which our national port might with dignity aspire.

The Back river is being examined. The survey is not sufficiently advanced to make definite statements. One great advantage of this route would be that a large area of land could be secured, for terminal facilities which are so essential to this transportation scheme.

I have the honour to be, sir,

Yours sincerely,

(Sgd.) C. R. COUTLEE,

*District Engineer.*

## APPENDIX G.

## WATER SUPPLY. FLOW MEASUREMENTS, &amp;c.

OTTAWA, June 30, 1905.

A. ST. LAURENT, Esq.,  
Engineer in charge,  
*Georgian Bay Ship Canal Survey.*

SIR,—In your letter of January 3 last, you informed me that the Minister had been pleased to approve of my appointment as special hydraulic engineer to investigate and report upon all hydraulic questions relative to the proposed Georgian Bay ship canal, and that it would be my duty:

To collect all available data with regard to the present condition of the established water power plants, as well as other unused powers on the canal route; to study the regime of the rivers to be canalized and collect the necessary information to strike out the curves of low and high water; to study the probable effect on low stage of the Ottawa river; of impounding surplus waters in the spring in the upper reaches of the river; to make a complete study and report with regard to the water supply for canal purposes at the height of land between Lake Nipissing and the head of the Mattawa river; and to ascertain whether enough water can be assured for lockages through navigation season for the passage of 10,000,000 tons to 20,000,000 tons freight—all available sources of water supply being investigated in carrying out these instructions.

To carry out the above instructions it was found necessary to divide the work into two general divisions—one comprising the water supply for canal purposes at the height of land and vicinity, the other the general study of the Ottawa river and its tributaries.

The first part of January was spent in organizing and furnishing the office and preparing a system for carrying out your instructions, and in gathering information which would show the amount of work already accomplished along this line and how much yet remained to be done. Considerable of this information was collected from the Crown Lands Department in Toronto and Quebec, from the Department of Marine and Fisheries and the Geological Survey, from the Geological Survey of the United States, from Mr. Stupart, director of the meteorological observatory in Toronto, from Mr. White, Geographer of the Department of the Interior, and from different power owners and individuals in and around Ottawa. A tabulated list of this information is given in appendix No. 1.

Mr. S. B. Johnson, of North Bay, was appointed draughtsman, and on January 24 he commenced drafting and compiling statistics.

*Division 1.*—Summit Supply.—The quantity of water required for summit purposes of a canal will vary according to the amount of traffic and the size of the vessels used, but can be estimated under six headings, as follows :—

1. Filling the locks.
2. Leakage of gates.
3. Evaporation and seepage.
4. Leakage over the waste-ways.
5. Power to operate gates.
6. Power for electric lights.



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Before commencing the work at the summit, an approximation of the sum required for this purpose was made. For preliminary purposes the locks were assumed to be 650 feet long, 70 feet wide and 23 feet of a lift. The traffic was assumed to be 10,000,000 tons moving east, and an average vessel assumed to carry 5,000 tons. In 200 navigable days we have, therefore 10,000,000 tons, or in one day we have 50,000 tons, which shows that ten full vessels carrying 5,000 tons are going east. This would require twenty lockages at the summit. The same number of vessels would be going west, which would make thirty lockfuls per day that the summit would have to supply, assuming that one-half of the vessels going west were accommodated by the waters of the vessels going east.

Assuming a lock 650 by 70 by 23 feet would give 363 (or say 375) cubic feet per second as the amount required for lockage.

For 20,000,000 tons this would be double, or 750 cubic feet.

For 30,000,000 tons this would be treble, or 1,125 cubic feet.

Leakage in gates is for present purposes assumed as fifty cubic feet per second.

Evaporation and seepage.—Evaporation from the water surface would be increased by the enlargement of the lakes, but until some definite plan is formed it is difficult to make any rational assumption. Assuming, however, the lake surface to be increased by ten square miles and to have a monthly evaporation of three inches, this would be from 15 to 30 cubic feet per second. If 30 cubic feet be assumed, it is expected this would allow for seepage.

Leakage over the waste-ways, is assumed to be 20 cubic feet per second.

Power required to operate the gates and light the canal is assumed to be 110 cubic feet per second. In case of deficiency of water supply this can probably be obtained more economically from some outside source, the energy being transmitted electrically.

The report of the Isthmian Canal Commission, 1899, assumed 200 cubic feet per second for power and other contingencies. The Deep Waterways Commission of the United States, in estimating the summit level water supply, assumed that the proper allowance for this purpose would be 40 to 50 cubic feet per second. An approximation, therefore, of the total amount required at the summit is about 575 cubic feet per second for 10,000,000 tons.

Trout lake is the highest body of water on the proposed canal route. It is about 23 feet above the level of Lake Nipissing and 30 feet above the level of Lake Talon. It has a drainage area of 72 square miles and is apparently inadequate to supply the demands of the canal. The investigations have been carried on with a view of raising Lake Talon to the level of Trout lake and using as a summit supply all the watershed which now drains through Talon chute. This drainage area is about 350 square miles.

Under natural conditions, without any storage, the run-off at low water would be insufficient for the purposes, and it was found necessary to investigate the conditions closely and determine the quantity of water flowing into Lake Talon from different sources with a view of storing the excess water of these feeders at times of high water to be utilized to supply the deficiency at low water. The two principal feeders are the Kai-bus-kaw river flowing from Lake Nasbosing and the North river, the latter having no large lakes on its course.

The study of the run-off in the watershed is rather involved as the lumbermen have built storage dams on most of the lakes, the water of which they use in the spring and during the summer to drive logs. These dams are opened and closed many times during the season and require close watching in order to find out the total run-off from any particular part of the watershed.

After the study of and trip through the lakes, gauges were placed in Turtle lake (which is practically a continuation of Trout lake), Trout lake, Lake Talon and Nasbosing lake (the principal feeder of Lake Talon as already mentioned). As these gauges were directly affected by the conditions of the dams, other gauges were



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placed—one in the Mattawa river below Trout lake, one at Kai-buskaw below Nasbonsing lake and one on the Mattawa river below Talon chute where the gauge heights were proportional to the quantity of water flowing and from which with daily readings and our measurements of flood, curves of the discharge and the quantity of water flowing from the watershed could be determined. Mr. A. J. McDougal, section C, had gauges at North Bay, Lake Nipissing and at the head of Trout lake.

To find out the minimum amount of water flowing from the watershed, measurements were taken during February and March. Some difficulty was experienced in finding suitable sections for measurements. On the Kai-bus-kaw, Menard's bridge formed a very convenient position for metering. About a mile below Turtle lake, at the outlet of White Fish pond, a very good section for the work was found, but at this section it was necessary for the observer to wade.

The river below Talon Chute is a series of very deep ponds or small lakes in which there is a very small current. These lakes are separated by rapids where the water is so agitated that proper metering cannot be taken. Finally after several of these places were tried a section was found on Talon Lake Narrows, but it was necessary to relate the measurements of gauge heights taken at a gauge about a mile below Talon Chute. After these measurements were taken M. MacLennan, who was appointed assistant engineer on March 16, continued the measurements. He has continued these gaugings at high water and at other times since in order to get a history of the water flow.

The run-off of any watershed being the rainfall minus the evaporation, in order to make a more systematic study of the water supply, arrangements were made to measure both of these to compare with previous years. Mr. Stupart, the director of Meteorological Observatory in Toronto, has had rainfall observations taken at Lake Talon, North Bay, Mattawa and other places for a number of years, and very kindly loaned us a dozen rain gauges to supplement these. A half-dozen of these were placed in the watershed of the summit—one at Menard's bridge, one at Nasbonsing, one at Turtle lake, one at White Fish pond, one at Pimisi bay and one at Lake Talon, and arrangements were made with the water gauge reader to read the rain gauge at the same time. These rain gauges have been read from April 20 last.

As the watershed will be considerably altered if the canal is built—that is the water surface, owing to the storage reservoirs, will be much greater and, therefore the evaporation will be increased—two tanks were built to measure the evaporation from the water surface. These were of galvanized iron, 4 feet square and 18 inches deep, and were intended to be floated in the lake itself—one at Lake Talon where one reservoir was to be and one at Lake Nasbonsing. Some difficulty was experienced in floating these owing to the waves breaking in at the corners, and finally the tanks were buried in the sand, at the side of the lake and the sand around them kept moist. Observations are made by the gauge readers twice daily as regards the temperature of the air, temperature of the water in the tank, temperature of the water in the lake, humidity of the atmosphere, pressure of the atmosphere and the general condition of weather, wind, &c.

From five to six months in the year the above conditions are interrupted, that is from December to the end of March or middle of April, when the moisture falls in the form of snow and does not melt until spring except in exceptional seasons. The greater percentage of this snow is probably evaporated, especially during the month of March, by the winds, but to rightly solve the problem of the run-off of any particular watershed in the north it is necessary to know how much water is received by the ground when the snow melts in the spring and how much of the snowfall has been evaporated. The measurement of evaporation from the snow surface is not as simple a matter as measuring the same from a water surface. It will compress and is liable to drift from any vessel in which it may be held. Professor Day, associate professor of Physics in the Ontario Agricultural College, has kindly consented to co-oper-

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ate with us in devising a method of determining the exact amount of moisture in our northern snow and the amount of evaporation from it, and in determining some formula by which we can predict the amount of evaporation during a certain season if we know the exact weather conditions.

It is not expected that any observations carried on for one year only are convincing, but it is hoped that a relationship will be found between these observations and the observations kept for a number of years at Toronto by Professor Stupart and that with this relationship a fair approximation can be formed of what it will be under the worst conditions—that is what the run-off will be with greatest evaporation and the least rainfall.

The excessive evaporation and depletion of ground storage from the very cold winter produced this spring a very small run-off from the watershed. The inhabitants of the district differ as to its smallness. Several declare it is the lowest that has occurred for forty years. Mr. Booth's agent, Mr. O'Connor, whose occupation renders him particularly observant of the quantity of water, states he has seen it once before in twenty-three years as low as it is this season. Although local information is generally at fault as regards the lowness of the water we are probably safe in assuming that the run-off this year is as low as will occur in cycles of ten years.

In measuring the run-off at Talon Chute after the ice left, the same sections used in the winter time were found to be the best for summer measurements—Menard's bridge, White Fish pond and Talon Chute. At Talon Chute narrows it was first intended to use a large canoe out of which to make current meter measurements, but that did not work satisfactorily and as many measurements were to be made at this point, a cable-way was erected with a car from which the measurements were taken. Arrangements were made with Mr. Booth's agent, Mr. O'Connor, that Mr. McLennan should be warned some time before the opening or closing of the gates of the dam so that he could be prepared for measuring.

These gaugings have now been completed practically for the three sections. A list of same is given in Appendix No. 2. It may be necessary to make a couple of measurements at extreme low water in the summer time but at present it is noted that measurements have been taken at every small change of the gauge height from low water to high water, so that the discharge of the river for the total season may be determined when our gauge records are completed.

A gauge was put in, in the Wisa Wasa river. This river drains into Lake Nipissing, but measurements were taken with a view of getting a canal from Wisa Wasa to Depot creek so that the water of the Wisa Wasa could be drawn over to drain into Nosbonsing lake. Lake Wisa Wasa is about one-half the size of Lake Nosbonsing, and it is expected that a reservoir of about six feet can be made there. The cutting of the canal will be about 5,500 feet long with a maximum cut of about 23 feet.

It is possible also at the height of land to store excess water in many of the smaller lakes which lie in Lake Talon watershed. Before investigating the size of these, however, it was thought best to investigate the impossibility of turning the waters of the Amable du Fond into those of Lake Talon or Lake Nosbonsing, in case the supply of water from the summit were insufficient. To do this a tunnel and a canal would be necessary, the total combined length of which would be between five and six miles. The cost could not be excessive, and the Amable du Fond watershed with its great lakes would supply ample water for the fullest requirements of the said canal. As instructed by you, a more detailed study of this feeder will be made later when the bush is more easily travelled and surveyed. Some gaugings of the Amable du Fond have been taken and these will be continued. Two gaugings have also been taken by Mr. MacLennan of the Mattawa river at Mattawa.

Division 2.—The second division of the work is the general study of the Ottawa river and its tributaries, comprising :—

1. A collection of all available data with respect to the present condition of established water power plants, as well as all other unused power along the canal route.

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2. The study of the regime of the rivers to be canalized in order to collect the necessary information to strike out the curves of the discharge of the river, and the study of the probable effects of impounding surplus water in the spring in the upper reaches of the river.

These questions depend primarily on the quantity of water flowing in the river, and particularly on the quantity flowing at extreme low and extreme high water.

Under Section 2.—The study of the regime of the rivers to be canalized, &c. Amongst the most important sub-divisions are :—

(a) The determination of the extreme high water flow at different points in the river from which to properly calculate the effects of dams and other structures to be built, especially the height of the water and extent of the flood.

(b) To determine, by co-relation from our water levels and measurements of flow of this and previous years, the probable duration of such floods.

(c) To determine the effect on these floods of storing the surplus waters of the spring in the reaches of the river, and to determine the extreme low water level and the height to which this can be raised by storage.

(d) To calculate if possible from these, with our statistics of previous years of rainfall, snowfall, sunshine, temperature, evaporation, &c., the conditions which produce such extreme high water and the probability of their occurrence.

(e) And to study the general problem of the run-off of the watershed and the possibility of the flow of the river being altered as the land is cleared and the character of the watershed changed.

To determine these points with great accuracy would require much more information than it is possible to obtain during the short period of the survey, but considerable information has been collected from previous years and it is hoped that a satisfactory solution of the above problem will be arrived at.

The principal information required is :—

Daily water levels along the route of the river.

The measurement of the quantity of water flowing in the river at its different stages.

Statistics of rainfall, snowfall, evaporation, &c.

Gauges were placed in the Ottawa river and in the principal feeders or tributaries, in March and April. A list of these is given on Appendix No. 3.

In the Ottawa itself, with the exception of the above, the district engineers have had gauges placed at the important stretches and have made arrangements for their being read. The government (Department of Railways and Canals) have gauges at the Rideau locks, Grenville, Carillon and Ste. Anne, which have been read since 1844, and which are available for our use. Many other water levels have been obtained and a list of these is added, Appendix No. 4.

The gauges used are made of galvanized iron strips, 12 feet, 16 feet and 20 feet long, enamelled white on the side and divided into feet and tenths by black lines. A dozen of these gauges can be easily carried by one man or shipped by express. In placing these gauges they are nailed to a plank and the plank securely nailed to a pier or dam in the river. In most cases planks are nailed alongside these gauges to protect them from ice or logs. The gauges are referred to some fixed bench marks so that later they can be checked and also tied in with the precise sea levels now being carried through.

Gauge readers are employed to read these gauges daily, and the results of these readings, with notes on the weather, &c., are sent in to the city office at the end of each week on post-cards supplied them from there. As a general rule the amount paid gauge readers for reading one gauge is \$5 per month, but in some cases where the gauge is at a considerable distance the amount is increased to \$7 or even \$10 per month.

The gauges on the tributaries were placed in as far as possible so that they would not be affected by the back water from the Ottawa river, but in many cases they are

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in some mill pond and are affected (especially in low water) by the condition of the gates of the dam. In these cases, however, the gauge recorder notes the condition of the gates when he reads the gauge so that allowance can be made. These heights are tabulated in this office.

Re : the measurement of the quantity of water flowing in the river at the different stages. These measurements were required every few miles along the route—especially the extreme high water measurements. To get this as thoroughly as the limits of the survey would allow it was decided to measure the Ottawa at its four branches at Montreal; at Besserer's Grove, twelve miles below Ottawa; at La Passe near Coulonge, and at Deux Rivières; twelve miles below Mattawa. By our measurement of the tributaries which enter the river between these different sections we would be able to determine, with sufficient accuracy the quantity of water at any other section of the river.

In choosing these sections the soundings made in the winter time in the locality at which measurements were wanted were examined and a suitable section for metering selected. This required that the bed of the river be regular, the current parallel and unbroken by eddies and swirls and that the current should not be greater than five feet per second, or less than one-half foot per second.

In measuring, the method of procedure was as follows :—

A suitable base line was selected. At one end of this base line a section was laid off across the river as nearly as possible perpendicular to the lines of the current. Five hundred feet along the base line a second section was laid off parallel to the first. Buoys were floated down and the position at which they crossed each of these parallel lines found by means of a transit intersection. This was done in five or six different places across the river, the line of these currents laid down on paper and the mean direction of the current determined. Then from the end of the base line the section for metering was laid perpendicular to the mean direction of the current as determined. (If any current was found which varied greatly from the mean direction then the section was rejected). This line was divided up into equal distances, of usually one hundred feet, and the angle that the line, drawn from each of these points to the end of the base line, made with the base line was obtained.

A small gasoline launch was equipped to do the metering work. It had a suitable rigging to cross the center of the boat, with pulley and winch, so that the meter with the heavy weight could be easily handled by one man. The meter was suspended by a wire cable on which the distances were marked. The boat was manipulated and drawn into position from two anchors thrown out above the section by a man in a boat. The launch was first gotten in line and then drawn so that the meter occupied a point suspending the proper angle at the end of the base line, so that measurements were taken at equal distances.

In making the flood discharge measurements the six-tenths method was used. The depth was first found with a sounding line and the meter suspended at a six-tenths down. Measurements taken at every two feet in depth at Besserer's Grove section gave a discharge within one and one-half per cent of what the six-tenths method gave. The above method of measuring was used generally on all sections on the Ottawa river. At La Passe and Deux Rivières a row boat was substituted for the launch. On the Back river and at St. Eustache measurements were taken from the bridges. In the majority of cases on the tributaries the measurements were taken in this latter way. On the Gatineau, measurements were taken from the launch by the six-tenths method. Float measurements were occasionally used as a check.

The above work was done by F. W. Anderson, assistant engineer, and party, and the results of these measurements to date are given in Appendix No. 5, together with the results of measurements made by others, especially Mr. C. E. Gauvin, superintendent of surveys, Department of Lands, Mines and Fisheries, Quebec, and published in his report.

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A complete set of gaugings of the Ottawa was made or collected by the writer for a report by Messrs. Kennedy on the Chaudiere and for other work, and permission to use these was obtained from the property owners and the Messrs. Kennedy.

The current meters were rated on an average once a week. In this work the style of meter was the Price current meter, 600, although on some of the work on the tributaries a Price Patent Accoustic meter was used. An admirable rating station was secured at Britannia in the power canal of the Metropolitan Electrical Company. This canal is not being used at present and the water in it has no current. A straight trestle 200 feet long crosses the canal and a suitable car was found on the works. The method of rating was the ordinary one used under such circumstances, viz.: the trestle was divided into equal distances so that the time of passing each of these could be noted and a uniform speed obtained. A plank, with a pulley, was attached to the car and the meter raised or lowered as required. Two men pushed the car at uniform rates of speed, and the number of revolutions, time and distances were noted.

As a general rule the engineer in charge of current meter work returned to the city on Saturday, and either on Saturday afternoon or Monday the current meter was again rated so that any difference in the rating of the meter from the previous week could be found. Very little variation was noted in the meter excepting a gradual wearing of certain parts which slightly increased friction.

Under section No. 3, the Meteorological Observatory of Toronto, have observations of the rainfall at various points in the watershed, some of them dating as far back as 1871. To supplement these, rain gauges were put in each of the following stations :—Fitzroy Harbour, Gower point, Bryson and Britannia. These have been read by the water gauge readers of these different places.

The results of the evaporation tests made by Mr. Stupart, in Toronto, are also included, Appendix No. 6. An evaporation tank has also been placed at Britannia in order to determine the difference between evaporation here and in Toronto. This is read by Mr. Johnson.

A list of plants made or collected by this office is given in Appendix No. 7.●

A statement of expenses is given, Appendix No. 8.

Yours respectfully,

ALEXANDER McDOUGALL,

*Hydraulic Engineer, Georgian Bay Ship Canal Survey.*





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## MEASUREMENTS OF THE KAL-BUS-KÖNG RIVER.

Locality.	Date.	Water level at gauge, these figures to be reduced to sea level.	Discharge cub. feet per sec.	Remarks.
	1905.	Gauge.		
Menard's Bridge.....	March 3..	134 32	19	Gauging through ice.
" .....	April 6..	134 04	148	
" .....	" 6..	134 04	146	
" .....	" 7..	133 96	140	
" .....	" 7..	133 96	143	
" .....	" 12..	133 99	129	Dammed by ice.
" .....	" 12..	133 99	128	
" .....	" 19..	133 85	116	
" .....	" 19..	133 85	99	
" .....	" 19..	133 85	110	
" .....	" 19..	133 85	116	
" .....	" 26..	133 75	99	
" .....	" 26..	133 73	96	
" .....	" 29..	133 78	109	
" .....	" 29..	133 78	116	
" .....	May 18..	134 27	169	
" .....	" 18..	134 27	169	
" .....	" 24..	133 87	114	
" .....	" 24..	133 87	118	
" .....	" 29..	136 27	598	Dam open.
" .....	" 29..	137 37	612	" "
" .....	" 29..	136 67	718	" "
" .....	" 29..	136 57	703	" "
" .....	" 29..	133 57	79	Dam closed.
" .....	" 29..	133 57	77	" "
" .....	" 29..	134 57	327	" open.
" .....	" 29..	139 07	407	" "
" .....	" 29..	135 47	492	" "
Red Rapids .....	June 14..	133 72	157	
Menard's Bridge.....	" 14..	133 72	95	
" .....	" 14..	133 72	111	

## MEASUREMENTS OF STREAMS WEST OF MATTAWA.

Amable du Fond R .....	May —..	627	
" .....	" —..	597	
Patois River .....	.....	305	
Estimated .....	.....	456	
Amable du Fond R .....	June 24..	421	Dam closed June 16.
" .....	" 24..	191	
Boom Creek .....	April 15..	56	
Depot Creek .....	" 12..	15	
Wistiwasig Brook .....	" 13..	3 90	



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## MEASUREMENTS OF THE OTTAWA RIVER.

Locality.	Date.	Water level at gauge, these to be reduce to sea level.	Discharge cub. feet per sec.	Source of Information.
	1905.			
3 miles below Vaudreuil .....	May 24 .....	.....	29,492	Hydraulic Dept., G.B.S.C.
Ste. Anne de Bellevue .....	" 24 .....	.....	39,815	" "
Back River at Cartierville .....	" 22 .....	.....	65,100	" "
Mille Ile River .....	" 20 .....	.....	16,664	" "
Total .....			151,071	
	1905.			
Besserer's Grove .....	May 8 .....	6 92	82,875	" "
" " .....	" 17 .....	9 38	119,000	" "
" " .....	June 13 .....	6 50	81,391	" "
	1904.	Deschenes Lake.		
Above the Chaudiere .....	March 17-19 .....	66 92	11,500	Chaudiere owners, Messrs. Kennedy.
" " .....	April .....	67 60	20,842	Biggar.
	1904.			
" " .....	May 9-12 .....	74 25	129,434	Chaudiere owners, Messrs. Kennedy.
" " .....	June 13 .....	74 66	145,118	" "
" " .....	July 4-5 .....	72 17	78,864	" "
" " .....	Aug. 1-2 .....	69 75	43,515	" "
	1900.			
Portage du Fort .....	Sept. 14 .....	Water level 2 ft. above its lowest	492	Dept. of Lands, Mines and Fisheries, Que.
Calumet Channel .....		Low water .....	assu'd 8,000	" "
" Village .....	Aug. 1900 .....	3 ft. above its lowest, Bryson .....		" "
	1905.			
4 miles above Campbell's Bay .....	May 12 .....	388 70	26,673	Hydraulic Dept., G.B.S.C.
		Gower Point.		
2 miles below Fort Coulonge .....	" 15 .....	333 37	60,654	" "
" " .....	June 28 .....	390 31	43,957	" "
	1901.			
Above La Roche Capitaine Rapids .....	March 14-16 .....	Low water .....	8,321	Dept. of Lands, Mines and Fisheries, Que.
	1905.			
Deux Rivières .....	May 15 .....		44,510	Hydraulic Dept., G.B.S.C.
	1901.			
Mattawa from T. railway bridge .....	March 13 .....	Low water .....	8,225	Dept. of Lands, Mines and Fisheries, Que.
La Cave Rapids, 6 miles above Mattawa .....	March 20 .....	" .....	est. 7,800	" "
Les Erables' Rapids, 10 miles above Mattawa .....	" 20 .....		assu'd 7,700	" "
	1902.			
Long Sault .....	March .....	Low water .....	appr. 6,500	" "

## MEASUREMENTS OF THE SOUTH SHORE TRIBUTARIES OF THE OTTAWA RIVER.

Locality.	Date.	Gauge.	Discharge.	Remarks.
	1905.			
La Graise R. (Rigaud) .....	April 5 .....	92 55	1,997	Hydraulic Dept., G.B.S.C.
" " .....	June 7 .....	89 34	28	" "
Nation R. (Plantagenet) .....	March 30 .....	95 64	17,708	" "
" " .....	June 8 .....	91 28	176	" "
Rideau R. (Canada Atlantic Ry. Co.) .....	April 20-21 .....	2 77	2,355	" "
" " .....	June 6 .....	1 40	391	" "
Mississippi R. (Galette) .....	April 8 .....	91 99	7,755	" "
" " .....	June 14 .....	89 48	2,005	" "
Madawaska R. (Arnprior) .....	April 14 .....	93 88	7,904	" "
" " .....	" 25 .....	93 46	6,362	" "
" " .....	June 15 .....	94 61	5,841	" "
Bonnechere R. (Renfrew) .....	April 26 .....	1 65	1,771	" "
" " .....	June 16 .....	1 50	1,613	" "
Muskrat R. (Pembroke) .....	April 28 .....	97 19	402	" "
" " .....	June 16 .....	97 14	441	" "
Petewawa River .....	April 27 .....	100 50	1,864	" "
" " .....	June 17 .....	102 36	4,000	" "

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## MEASUREMENTS OF THE NORTH TRIBUTARIES OF THE OTTAWA RIVER.

Locality.	Date.	Gauge level of water.	Discharge cub. feet per sec.	Source of information.
	1905.			
North R. (St. Andrews).....	June 3..	82.31	883	Hydraulic Dept., G.B.S.C.
Rouge R. (Calumet).....	" 1..	90.33	4,277	" " "
North Nation R. (Plaisance).....	" 1..	92.82	1,546	" " "
	1901.			
" (below Lake Simon).....	Nov. 8-9..		237	Dept. of Lands, Mines and Fisheries, Que.
	1905.			
Blanche R. (Thurso).....	May 31..	103.0	186	Hydraulic Dept., G.B.S.C.
Du Lièvre (Duléivre).....	" 30..	91.61	12,456	" " "
" (Township of Campbell).....	1902.			
	Sept. 24 ..		1,488	Dept. of Lands, Mines and Fisheries, Que.
" (L'Original Chute).....	" 24 ..		est. 900	" " "
	1905.			
Big Blanche R. (E. Templeton)...	May 29..	97.23	261	Hydraulic Dept., G.B.S.C.
Gatineau R.....	" 18..	6.10	35,571	" " "
" .....	June 10 ..	3.30	19,250	" " "
	1902.			
" (from Gatineau P. Bridge) .....	October. ....		5,240	Dept. of Lands, Mines and Fisheries, Que.
" (below Maniwaki) ....	" .....	Ordinary summer level E. channel.....	3,375	" " "
		W. channel....	875	" " "
	1905.			
Quion R.....	May 30 ..	105.10	208	Hydraulic Dept., G.B.S.C.
Coulonge R.....	" 31..	105.30	6,466	" " "
" .....	June 29..	104.40	3,143	" " "
Black R. (Waltham).....	May 31..	104.43	3,998	" " "
" .....	June 29..	103.64	1,858	" " "
DuMoine R.....	June 2..	103.80	4,000	" " "
Magnisippi R.....	" 1..	89.92	621	" " "
	1902.			
Kippawa R., at outlet to lake....	March 22..	Lowest water ...	603	Dept. of Lands, Mines and Fisheries, Que.
L. Kippawa into Gordon Creek...	" 24. ....		43	" " "

## APPENDIX H.

## TEST BORINGS

## REPORT ON TEST BORINGS TO JUNE 30, 1905

Acting under instructions from you, contained in your letter of April 25, 1905, arrangements were made with Mr. S. J. Chapleau, engineer-in-charge of the Nipissing district, to place one of the Pierce Test Boring Machines on section 2, at Mattawa, Ont.

This party has been called Test Boring Party No. 1.

The equipment was shipped to Mattawa on May 4, and actual boring operations were begun on May 8, on a proposed location passing back of the town of Mattawa. This line is approximately  $1\frac{1}{2}$  miles in length, and connects the Mattawa and Ottawa rivers.

The material encountered on this location was found to consist of a deposit of closely compacted boulders and gravel, varying in depth from four to fifteen feet, overlying fine sand, coarse sand, and sand and clay. No rock above grade was met with here.

This deposit of boulders and gravel is of glacial drift origin, and is characteristic, to a greater or less extent, of the Laurentian formation throughout the Nipissing and most of the Ottawa districts.

Considerable trouble has been experienced in using the Pierce Test Boring Machine, where this boulder drift is encountered, and it has been found necessary to finally adopt the method of digging pits, and removing the boulders by means of a tripod and block and tackle. When this was accomplished, the machine was set up and satisfactory progress was made.

The removal of this boulder drift by the above method, is a slow and arduous undertaking. The nature of the material and methods used in excavating are shown in the accompanying photographs.

Penetration by means of the Pierce Machine, in the underlying strata, in a succession of driving of the 2-inch casing, and washing out inside with 1-inch pipe connected with a force pump.

The use of dynamite has been resorted to, with considerable success, in connection with the use of the Pierce Machine, in loosening up compacted material, and breaking up occasional boulders.

Samples of the different classes of materials encountered are kept in properly labelled four ounce bottles.

Mr. H. M. Davy was appointed to take charge of this party, and entered upon his duties on May 20.

## SUMMARY OF WORK, TEST BORING PARTY 1, MATTAWA, ONT.

Test borings on the Mattawa location were commenced on May 8, and completed on June 7, 1905.

Number of test holes, 16.

Average distance apart, 400 feet.

Approximate depth of each hole, 18 feet.

Pit excavation, 54 feet boulders and gravel.

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Test boring machine 230 feet. Fine sand, coarse sand, sand and clay, gravel.

Force employed, assistant engineer, foreman, 4 labourers, 1 horse and cart and teamster.

## TEST BORING PARTY, NORTH BAY, ONT.

As the surveys on Section 2 were not sufficiently advanced to permit of further test borings being taken, the whole equipment was moved up to North Bay, on June 8, and test borings commenced on June 10, on the line leading in from Rocky Point, Lake Nipissing, to Turtle lake.

No difficulty was encountered in these borings, rapid progress was made, and work was completed on June 26.

## SUMMARY OF WORK, TEST BORING PARTY 1, ROCKY PT. LINE.

Total number of test holes. . . . .	85
	Feet.
Average distance apart. . . . .	100
Total depth bored. . . . .	2,087
Average depth of hole. . . . .	24.6

Nature of materials encountered: sandy loam, swamp muck, fine sand, fine sand and clay, coarse sand.

Rock surface, Archaean gneiss, was encountered above grade in fifty-two of the above eighty-five holes.

## TEST BORING PARTY NO. 2.

Test Boring Party No. 2, was organized in June, to operate on the Montreal division.

Arrangements were made with Mr. C. R. Coutlée, to place this party on section 9, on a line from the Lachine canal, passing through the town of St. Paul, Quebec, and entering the St. Lawrence river opposite Nun's island.

The equipment was shipped by Ottawa river boat to Côte St. Paul lock, Lachine canal, on June 11, and the full complement of party was made up on June 18 and 19. Boring operations began on June 21.

The material encountered on this location, up to June 30, was sandy loam, sand, shale gravel, shale float and Utica shale.

Considerable rock was encountered above the grade line. The nature of this rock is Utica shale, and it has been excavated in Montreal harbour, and on Lake St. Louis, without resorting to blasting.

A profile of this rock surface, over the line of borings, shows a marked anticline, below grade at the Lachine canal, and rising up at summit to within  $3\frac{1}{2}$  feet, from ground surface, near the public school house, town of St. Paul, and then dipping rapidly to the south.

## SUMMARY OF WORK, TEST BORING PARTY NO. 2, TOWN OF ST. PAUL, QUE.

Total number of test holes. . . . .	7
	Feet.
Average distance apart. . . . .	500
Pit excavation (float shale). . . . .	24
Boring machine (loam, sand, shale gravel). . . . .	56
Total depth bored. . . . .	80
Average depth of each hole. . . . .	11.4

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Force employed : one assistant engineer, one foreman, three labourers, one horse and cart and teamster.

Period covered, June 11 to June 30.

As the period covered by the operation of both test boring parties has been so short, it has been considered advisable to make any attempt to compile an average cost record per foot bored, which would have to include cost of equipment and initial outlay.

A copy of the general instructions to assistants in charge of test boring parties, is inclosed.

I beg to remain, sir,

Your most obedient servant,

(Sgd.) A. R. DUFRESNE.

## TEST BORING (GEORGIAN BAY SHIP CANAL SURVEY).

### INSTRUCTIONS TO ASSISTANT ENGINEERS IN CHARGE.

1. The object of these test borings is to determine the depth and character of each different kind of material to be excavated in the proposed canal location, in order that a correct estimate may be made.

2. The location of each test boring must be fully determined with reference to some stadia or transit survey, in such a manner as to enable the accurate location of the boring on the map. The elevation of the ground surface or river surface (from gauge) at which the boring is made, must also be determined. The engineers in charge of the divisions on which borings are to be made, will furnish you with an individual plan, showing the locality and the extent of the borings required, and will point out to you the triangulation and traverse points, and give you the ground surface elevation of the points to be bored. The elevation of the grade of excavation will also be furnished you.

3. Careful measurements are to be taken to each change of material found in the boring, from the elevation of the ground surface, and samples are to be preserved in tins furnished for that purpose.

4. The greatest care must be taken in the determination of the elevation of rock surface, and it is desired to firmly impress upon those in charge of the taking of these borings to avoid having the boring hold up on hard material or boulders and call the same rock surface. Rock surface can generally be determined by taking another boring or by using dynamite.

5. Engineers in charge of boring operations are required to keep a complete daily record of work and events connected with their work in a daily journal.

# PRECISE LEVELS

DEPARTMENT OF PUBLIC WORKS OF CANADA,  
GEORGIAN BAY CANAL,  
GEODETIC LEVELLING,

CHIEF ENGINEER'S OFFICE,

OTTAWA, Friday, June 30, 1905.

ARTHUR ST. LAURENT, Esq.,  
Engineer-in-charge.

SIR,—I have the honour to submit the following report of work performed up to date, in connection with the Geodetic Levelling.

THE LEVELLING WAS COMMENCED IN NOVEMBER, 8 MONTHS AGO.

*November, 1904.*

The levelling was started at C.P.R. bridge, Lachine; following lower Lachine road to Lachine canal, then along Main or Post road to Beaconsfield.

*December, 1904.*

Along Post road from Beaconsfield to Ste. Anne de Bellevue; along G.T.R. from Ste. Anne de Bellevue to Vaudreuil; Post road, from Vaudreuil to Cascades; north side of Soulanges canal, from Cascades to Coteau Landing.

*January, 1905.*

Along C.P.R. from Vaudreuil to Rigaud; Rigaud to Pointe Fortune; Rigaud to Barb; The Brook to Caledonia Springs.

*February, 1905.*

Along C.P.R. from Caledonia Springs to Vankleek Hill; along C.A.R., from Vankleek Hill to Hawkesbury; C.P.R., from Vankleek Hill to Barb St. Eugène; The Brook to Central Station, Ottawa; Central Station to foot of Rideau canal; Central Station to City Hall, Ottawa; along C.A.R., from Carp to South March Station.

*March, 1905.*

Along C.A.R., from South March to over-head crossing near Britannia; along C.P.R., from over-head crossing to Union Station; Union Station to City Hall, via Broad, Ottawa, Wellington, Bank and Albert streets; Ottawa Waterworks to foot of Rideau canal, via Union, Hull, Alexandria Bridge and Rideau canal; along C.A.R., from Carp to Arnprior.

*April, 1905.*

Along C.P.R., Arnprior to Sand Point; Haley's to Sand Point, Haley's to Pembroke; Chalk River to Pembroke.

*May, 1905.*

Along C.P.R., Chalk River to Mackay; Deux Rivières to Mackay.

June, 1905.

Branch lines; C.P.R., track at Bissetts to Ottawa river; C.P.R., track at Deux Rivières to foot of Deux Rivières rapids via Ottawa river; along C.P.R., from Deux Rivières to Eau Claire; North Bay to Eau Claire.

AMOUNT OF LEVELLING COMPLETED UP TO DATE.

	Field work : num- ber of days spent outdoors.	Amount of one day during whole month	Minimum of one day during whole month.	Maximum of one day during whole month.	Average for working days during whole month.	Average for each com- plete month.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1904.						
November . . . . .	15	18·00	·25	3·00	1·20	·50
December . . . . .	16	22·00	·50	3·25	1·35	·71
1905.						
January . . . . .	20	55·00	1·11	5·34	2·80	1·78
February . . . . .	19	53·00	·27	5·34	2·79	1·89
March . . . . .	20	57·00	·27	5·74	2·85	1·84
April . . . . .	16	54·00	·97	6·08	3·38	1·80
May . . . . .	16	56·00	1·64	5·40	3·50	1·81
June . . . . .	18	66·00	·21	6·32	2·72	1·57
General totals and average . . . . .	140	381	·21	6·32	2·72	1·57

LEVELLING—REMAINING TO BE DONE.

	Miles.
Cornwall to Coteau Landing . . . . .	35
Rouse's Point to Lachine via St. John's, P.Q. . . . .	50
North Bay to Toronto . . . . .	227
Allandah to Collingwood . . . . .	35

Total . . . . . 347

Averaging 1·6 miles per day =  $\frac{347}{1·6} = 217$  days = 7 months.

The remaining levelling should therefore be completed by February 1, 1906.

Your obedient servant,  
(Signed) CHARLES F. X. CHALONER.



PART V

REPORT ON GOVERNMENT TELEGRAPH LINES

FOR THE

FISCAL YEAR ENDED JUNE 30, 1905



## DEPARTMENT OF PUBLIC WORKS.

OFFICE OF THE GENERAL SUPERINTENDENT,

OTTAWA, Ont., December 28, 1905.

F. GELINAS, Esq.,

Secretary, Department of Public Works.

Sir,—I beg to submit herewith my report on the Government Telegraph Service for the twelve months ended June 30, 1905.

This report, as usual, is prefaced by a list to the present date of the land lines and cables in operation ; with data of lengths, year of construction, number of offices at present established, and an estimate of the traffic handled in each instance.

The usual tabular statements, giving lists of offices, operating staff, &c., in the several districts are appended to the report ; likewise the tariff sheets, showing the rates charged for messages on the several lines.

I have the honour to be, sir,

Your obedient servant, .

,  
D. H. KEELEY,  
*General Superintendent.*

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## HEAD OFFICE : DEPARTMENT OF PUBLIC WORKS, OTTAWA.

## EXECUTIVE.

The Hon. Chas. S. Hyman, Minister of Public Works.

A. Gobeil, Esq., I.S.O., Deputy Minister of Public Works.

## STAFF AT HEADQUARTERS.

D. H. Keeley, general superintendent.

R. Keeley, accountant, telegraph branch.

J. A. Parr, technical assistant.

Miss A. Hardeastle, stenographer.

## GENERAL INSPECTORS.

A. B. McDonald, Meat Cove, Cape Breton, lines in Nova Scotia and New Brunswick.

M. W. Crean, Quebec, lines on north shore St. Lawrence and Anticosti.

J. S. Macdonald, Qu'Appelle, lines in North-west and south British Columbia.

J. E. Gobeil, lines in Yukon division.

## SUPERINTENDENCIES.

Edwin Pope, Quebec, dist. supt., North Shore and G.N.W. traffic.

J. C. Taché, dist. supt., Chicoutimi district and north shore to Bersimis.

E. H. Tetu, Penticost, dist. supt., North Shore, East Bersimis.

A. Malouin, dist. supt., West Point, Anticosti Island.

A. LeBourdais, Grindstone, dist. supt., Magdalen islands.

D. C. Dawson, St. John, N.B., dist. supt., Cape Breton system.

Mrs. C. C. Seely, Grand Manan, N.B., dist. supt., Bay of Fundy system.

J. McR. Selkirk, Leamington, Ont., dist. supt., Pelee Island system.

Robt. C. Macdonald, Qu'Appelle, dist. supt., North-west Territoires.

Wm. Henderson, Victoria, dist. supt., British Columbia, south.

C. S. Stevens, Kamloops, B.C., supt., Penticton line.

J. Y. Rochester, Vancouver, B.C., acting supt., Yukon system.

J. T. Phalen, Ashcroft, B.C., dist. supt., Ashcroft-Atlin.

A. B. Clegg, White Horse, Y.T., dist. supt., Atlin-Boundary.

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## GOVERNMENT TELEGRAPH SERVICE.

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Offices.	Yearly Average of Messages Sent.
			Land Lines.	Cables.	Total.		
			Miles.	Kt's.			
Newfoundland..	Port au Basque—Cape Ray. ....	1883	14	.....	14	2	
Nova Scotia ....	North Sydney—Meat Cove (with loops).	1880-02	167 $\frac{1}{4}$				
"	Across Bras d'Or Channel. ....	1880					
"	" St. Ann's Harbour. ....	1887			168 $\frac{1}{4}$	17	5,000
"	" Ingouish Harbour. ....	1887					
"	Bras d'Or—Kempt Head. ....	1904	20		20	3	
"	Meat Cove—St. Paul's Island. ....	1890		20	23	1	50
"	On St. Paul's Island. ....	1890	3				
"	Mabou—Meat Cove. ....	1887-00	109		109	9	2,500
"	Barrington—Cape Sable. ....	1883	16				
"	Across Bear Point Channel. ....	1883		1 $\frac{1}{4}$	17 $\frac{3}{4}$	Leased.	
"	" Lt. House Channel. ....	1883					
"	Mabou—Port Hawkesbury. ....	1903	41 $\frac{1}{4}$		73 $\frac{3}{4}$		
"	Port Hawkesbury—St. Peters. ....	1903	32				
"	St. Peters—Main-à-Dieu. ....	1904	84 $\frac{1}{4}$			15	1,500
"	Main-à-Dieu—Scatarie. ....	1902		1 $\frac{3}{4}$	128 $\frac{3}{4}$		
"	On Scatarie Island. ....	1904	7 $\frac{1}{4}$				
"	Gabarous—North Sydney. ....	1904	35 $\frac{1}{2}$				
New Brunswick.	Chatham—Escuminac. ....	1885	42		42	6	600
	<i>Bay of Fundy System:</i>						
"	Eastport—Campobello. ....	1880		1 $\frac{1}{4}$			
"	On mainland Eastport. ....	1880					
"	On Campobello Island. ....	1880	7 $\frac{1}{2}$				
"	Campobello—Grand Manan. ....	1880		7 $\frac{1}{4}$	44 $\frac{1}{4}$	10	2,500
"	On Grand Manan Island. ....	1880	25 $\frac{1}{4}$				
"	Grand Manan—Cheney's Island. ....	1890		$\frac{1}{2}$			
"	On Cheney's Island. ....	1890		$\frac{3}{4}$			
"	Cheney's Island—Whitehead Island. ....	1890		$\frac{3}{4}$			
"	Partridge Island—Fort Dufferin. ....	1900		$\frac{3}{4}$	$\frac{3}{4}$		
Quebec.	Bay St. Paul—Chicoutimi. ....	1881-04	98		98	6	
"	St. Alexis—St. Catherines Bay. ....	1904	78		78	5	2,000
"	Murray Bay—St. Agnes. ....	1904	14 $\frac{1}{2}$		14 $\frac{1}{2}$	2	
"	Bay St. Paul—Petite River. ....	1904	13		13	1	
"	Chicoutimi—St. Charles. ....	1903	37				
"	St. Anne—LacClaire. ....	1903	15		61	10	
"	St. Anne—St. Fulgence. ....	1903	9				
	<i>North Shore Line:</i>						
"	Murray Bay—Chateau Bay. ....	1881-01	1,028 $\frac{1}{2}$				15,000
"	Across Saguenay River. ....	1883		1 $\frac{1}{4}$			
"	Bersimis to Manicouagan. ....	1883		12	1090	66	
"	Manicouagan to Godbout. ....	1883		26			
"	Chateau Bay—Belle Isle. ....	1901		22 $\frac{1}{4}$			
"	Bersimis—Godbout (alternative line). ....	1904-05	80		80		
	<i>Quarantine System:</i>						
"	Quebec—L'Ange Gardien. ....	1885	13				
"	L'Ange Gardien—Orleans Island. ....	1885		$\frac{3}{4}$			
"	On Orleans Island. ....	1885	29 $\frac{1}{4}$				
"	Orleans Island—Isle Réaux. ....	1889		2	52 $\frac{1}{2}$	8	2,300
"	On Isle Réaux. ....	1889	2 $\frac{1}{2}$				
"	Isle Réaux—Grosse Isle. ....	1889		2			
"	On Grosse Isle (all told). ....	1885-94	3 $\frac{1}{4}$		5 $\frac{1}{2}$	1	
"	St. Jean—St. Famille (loop). ....	1904	5 $\frac{1}{2}$				

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GOVERNMENT TELEGRAPH SERVICE—*Concluded.*

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Offices.	Yearly Average of Messages Sent.
			Land Lines.	Cables.	*Total.		
			Miles.	Kt's.			
Quebec	<i>Anticosti System:</i>						
	Gaspé—L'Anse à Fougère	1881	28				
	L'Anse à Fougère—Anticosti	1881		44½			
	On Anticosti Island	1881-90	223½		316½	9	1,500
	Anticosti—Long Point, Mingan	1890		21			
	<i>Magdalen Island System:</i>						
	Meat Cove, C.B.—Magdalen Islands	1880		55			
	On Magdalen Islands	1881-02	83½	½			
	Grosse Isle—Brycn Island	1902		11	243	12	2,100
	Bryon Island—Anticosti	1902		93			
Ontario	<i>Pelee Island System:</i>						
	Leamington—Point Pelee	1889	12				
	Leamington Dock—Pelee Island	1901		17	42½	9	800
	On Pelee Island	1889-00	13½				
North-west	Qu'Appelle—Edmonton	1883	625		625	16	9,500
	Moosejaw—Wood Mountain	1885	90½		90½	2	300
	Wood Mountain—Willow Bunch	1904	38		38		
	Edmonton—Indian Ag. & Stoney Plain	1904	24		24	5	2,000
	Edmonton—Athabaska Ldg	1904	98		98		
	Duck Lake—Batoche	1902	9		12½	3	
	Duck Lake—Indian Agency	1902	3½				
	Edmonton—St. Albert	1887	9		36	3	200
	St. Albert—Qui Barre and Alexandria	1902	27		22	1	2,500
	Lloydminster (loop) near Pitt	1904	22		11½	2	400
British Columbia	Victoria—Andrew and Whitford	1904-05	11½				
	Ashcroft—Quesnelle (local wire)	1878-87	215		215	6	800
	Victoria—Cape Beale	1891	118		118	8	
	Nanaimo—Comox	1893	81		81	2	8,000
	Parksville—Alberni	1895	29½		86½	5	550
	Alberni—Cape Beale	1899	57		67	9	1,400
	Alberni—Clayoquot	1902	96½		168	7	6,000
	Kamloops—Lower Nicola	1899	67		35	2	1,000
	Lower Nicola—Penticton	1905	168		92	5	1,500
	Vernon—Kilowna	1905	35		24½	4	
Yukon	Golden—Windermere	1901-02	92				
	Duncan Sta.—Salt Spring Isl. & Extens.	1902-04	24				
	Ashcroft—Dawson and Boundary	1899-01	1845				
	Hazelton—Port Simpson and Aberdeen	1901-02	202½				
	Tagish—Cariboo Crossing	1901	18		2,252½	66	45,000
	150 mile Sta.—Quesnelle Forks	1902	64				
	Ashcroft—Lillooet	1896	62				
	Quesnelle—Barkerville	1887	61				
Total, end of 1905.			6586	344½	6930½	338	115,900

\* For convenience in totalling, the knots of cable are regarded as statute miles.

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## REPORT ON THE GOVERNMENT TELEGRAPH SERVICE 1904-5.

## EXPLANATORY NOTES.

The tabular statement prefacing this report shows the total mileage, &c., of the telegraph lines operated by the government. Lines that have been subsidized or constructed and transferred by the government for operation by private companies are not included in this list.

The matter in the following pages comprises merely a statement of specific actions taken in the course of the year, and in any case where no particular reference is made to a line found mentioned in the list, the understanding intended to be conveyed is that that line has been satisfactorily operated throughout the year, without any change of conditions since last made mention of in the annual reports.

## NEWFOUNDLAND.

The line from Port au Basque to Cape Ray continued to be operated as heretofore, under an arrangement with the Anglo-American Telegraph Company.

## MARITIME PROVINCES.

General Inspector.—With a view to facilitating the operations of the service and securing uniformity as far as practicable in the upkeep of the lines, the appointment of Mr. A. B. McDonald, agent at Meat Cove, C.B. to the position of general inspector for all of the lines in New Brunswick and Nova Scotia was made dating from May 9, 1905.

Scatarie Island Cable.—This cable which had been put in order on July 23, 1904, became interrupted again on November 3 following and has since remained unattended to owing to the cables ship *Tyrian* when available being required on more important sections.

General Repairers.—For the Port Hawkesbury-Gabarous section Geo. E. Bissett, of St. Peters, was appointed general repairer in August, 1904, and V. A. McLennan, of Inverness, was appointed to take the place of W. J. Smyth, former general repairer for the Port Hawkesbury-Meat Cove section from March 1, 1905.

The poles along the line between Ingonish and Meat Cove were overhauled and reset; and some general repairs were made along the other lines in Cape Breton in the course of the autumn of 1904 and the summer of 1905; the work being done by the regular linemen with local assistance in the several sections. With the exception of a few poles obtained locally where required no renewals were called for, and the lines are now in good order for the coming winter.

Construction of new lines.—The line mentioned in last year's report as being built by Mr. Donald McKenzie, between Big Bras d'Or and Upper Kempt Head, 20 miles, was duly carried to completion and offices were opened at the places mentioned hereunder :—

Boularderie Centre, Mrs. J. B. McKenzie, agent, October 24, 1904.

Ross Ferry, Miss Johanna Campbell, agent, October 24, 1904.

Upper Kempt Head, Mrs. Murdock McKenzie, agent, November 27, 1904.

Provision has been made in the estimates for the current year for the further extension of this line along the south side of Boularderie and for a line from North Sydney to Eskasoni. The work is now in hand and being performed by day labour, the first named section in charge of Donald McKenzie and the other in charge of Joseph Logue who will on completion take the position of general repairer for these new lines and the older section between Big Bras d'Or and North Sydney.



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Local repair sections.—The Cheticamp-Grand Etang section was given up by P. LaRede, the former local lineman in May, 1904. The line was attended to by persons temporarily employed on occasion until in May, 1905, when Mr. J. L. Chiasson was appointed, the yearly allowance being increased to \$40, in place of \$25 previously paid.

New offices and office changes :—

At Judique, in July, 1904, Miss McPherson, former agent operator resigned and was succeeded by Mrs. M. McDonald.

At Lardois the office was closed March 18, 1905, the former agent-operator, Miss Brynmur having resigned. It was re-opened on June 22 following, with Miss Mary D. Finlayson, as agent-operator.

At Strathlorne, midway between Mabou and S. W. Margaree, the establishment of an office was applied for and arrangements to that end were put in hand. (Note.—This office was opened on September 25, 1905, with Miss R. E. McLean as agent-operator.)

At Grand Etang, the office was closed on March 31, 1905, the former agent-operator G. Doucet having resigned.

Low Point Line.—In December, 1904, an arrangement was made locally with the telephone company at North Sydney, whereby the wires of the loop line to Low Point were transferred to their poles and the old pole line that paralleled theirs and had fallen into decay, was done away with.

St. Paul's Island Cable.—The cable between Meat Cove and St. Paul's Island became interrupted on November 14, 1904. The trouble was made out to be in deep water and the services of the ss. *Tyrian* are in requisition for the repair. This stretch with the several others elsewhere mentioned is to be taken in hand as early as practicable next season.

Magdalen Islands.—The work of removal of the pole line and wire throughout the Magdalen Islands system was carried to completion in the course of the past season, 1905, and the further extension of the Point Basse loop three miles to South Beach was made, and an office opened there with Miss Chevrier as agent-operator (July 7, 1905).

Special winter tariff.—With a view to rendering the existing facilities for communication with the mainland as useful as possible during the season of suspension of the mail service, a special rate of  $\frac{1}{2}$  cent per word was established last winter for messages between the Magdalen Islands and Meat Cove where the mainland telegraphs are joined at the regular tariff, or the mail is reached for the interchange of letters. It is proposed to continue the same arrangement yearly in the interests of this isolated community.

Bryon Island cables.—The stretch between Bryon Island and Anticosti became interrupted on December 11, 1904, and the one between Bryon Island and the Magdalen Islands on February 11, 1905. In both cases so far as could be locally determined, the trouble is in deep water necessitating the services of the ss. *Tyrian* but it was not found possible to put the ship at work there before the season was too far advanced to make an attempt at repair practicable. It is expected the *Tyrian* will be available early next season when these and other repairs called for can be attended to.

Anticosti Island.—The work of renewal of the wire between Bescie River and Fox Bay of which mention was made in last year's report, was in the course of the past season carried to completion, the work being done by the local general repairer with assistance temporarily engaged on the spot. The line is now considered to be in good and reliable condition throughout.

Long Point—Anticosti cable.—This stretch that had been put in order in August, 1903, as mentioned in last year's report, gave out again on July 16, 1904, but was soon afterwards repaired August 5, 1904, by the ss. *Tyrian*. It, however, ceased to be operative again on November 14, following. In the course of the past season the ss.

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*Tyrian* visited the locality and attempted a repair, but was obliged to leave it before completion, and when ready to return and resume the work the season was too late for the purpose and the repair had to be deferred until next season.

Gaspé—Anticosti cable.—It is perhaps well to mention that at the date of this writing (December 28, 1905), the conditions are such that the Island of Anticosti is altogether cut off from telegraph communication with the mainland in consequence of the Gaspé cable having become interrupted on November 20, 1905, when it was too late in the season to attempt a repair. It will not now be possible to restore the connection till next spring. The possible utilization of the Marconi wireless telegraph stations of the Department of Marine and Fisheries at Heath Point and Fame Point was taken into consideration, but the prospective cost of the unimportant service required was thought too great to be warrantable.

Escuminac line.—This line was thoroughly overhauled and put in good order in the autumn of 1904.

At Black river an office was established in July, 1904, with Miss M. J. McDougall as agent-operator.

## BAY OF FUNDY.

Grand Manan-Campobello system.—Some general repairs were made along the line in the course of the past season, and the whole put in good order. There were no interruptions throughout the year.

Note.—The cable between Campobello and Eastport ceased working on July 5, 1905, and when the ss. *Tyrian* was, about September 1, ready for sea to take up her season's work she was sent round there first and this important connection was restored on September 5, 1905.

Barrington-Cape Sable Line.—In the course of the past summer the cable stretch  $1\frac{1}{2}$  miles across Barrington Passage gave out and on examination was found to be in bad condition throughout, the iron sheathing wires being in many places corroded away. It was not practicable to send the cable ship to put down a new length. The Telephone company, however, found it practicable to re-establish the connection with the main land by constructing an additional 5 miles of land line to a narrower channel where only a  $\frac{3}{4}$ -mile length of cable was called for, this was accordingly carried out; the land line was built at the cost of the government in lieu of an expenditure for the greater length of cable and a  $\frac{3}{4}$ -mile length of cable was shipped on a reel and laid in position with very satisfactory results. As now arranged, any repairs that may be called for from time to time can be readily effected by local labour.

Partridge Island Telephone Line.—The shore ends of the cable supplied for this connection in 1899 became exposed by the wearing action of the sea, but were on examination found to be in good condition and were re-trenched in December, 1904.

Yarmouth Telephone Company.—In aid of a required extension of the Yarmouth Telephone company's system from the mainland to Harry's Island, a mile length of deep sea g.p. cable, of the reserve stock on hand at Halifax for repair purposes, was contributed by the government and delivery was made in the course of the past summer.

## NORTH SHORE AND CHICOUTIMI SYSTEM.

General Inspector.—As in the case of the lines in the maritime provinces, the appointment of a general inspector, Mr. M. W. Crean, formerly of the Yukon Telegraphs, with office at Quebec, was made in May, 1905. This inspectorship embraces all of the lines in the Chicoutimi district, the Quarantine and North Shore lines and includes Anticosti Island.

District Superintendency.—Beginning with the month of January, 1905, the superintendence of operation and maintenance of the lines in the Chicoutimi district

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and on the North Shore west of Bersimis has been added to the duties of the resident engineer, Mr. J. C. Taché, at Chicoutimi. The superintendence of the traffic between the government lines and the Great Northwestern Telegraph system continuing as heretofore.

New lines in Chicoutimi district.—The new lines in the Chicoutimi district mentioned in last year's report have been added to by an extension from St. Fulgence to Descente des Femmes 16 miles, and a loop line  $4\frac{1}{2}$  miles from off the main line near St. Alexis to Ferland. Offices were opened as hereunder :—

At Lac Laurent, agent-operator, Simon Gagnon, July 1, 1905.

At Descente des Femmes, agent-operator, Aug. Villincouve, August 1, 1905.

At Ferland, agent-operator, Benite Lavoie, May 1, 1905.

Under appropriations that were made for the purpose for the current year the above mentioned line to Descente des Femmes is being carried down a distance of 31 miles to connect at Sacré Cœur, which is at present the terminus of a branch from Tadousac, and a second wire is being put on the pole line between St. Alexis and Chicoutimi,  $14\frac{1}{2}$  miles, which will afford direct connection between Chicoutimi and St. Catherine's Bay via Anse St. Jean.

New Offices and Office Changes.—Besides the offices above mentioned in connection with the new lines in the Chicoutimi district, the following is to be noted.

At St. Ambroise on the Chicouimi-St. Charles line, the office was closed in May, 1905, on the resignation of the former agent, O. Grondin, but it was reopened in June with A. Simard as agent-operator.

At Anse Cheval.—The office was closed on April 30, 1904. It was reopened on February 1, 1905, with Mr. Jos. Degagné, as agent-operator.

And on the north shore line, west of Bersimis.

At Bon Desire, between Tadousac and Bergeronnes, an office was opened August 1, 1904, with Madame E. Gauthier as agent-operator.

At St. Fidèle, the office was closed on April 12, 1904, the former agent, the Rev. N. A. Parent having gone away. It was reopened December 1, 1904, with Jos. Desbiens as agent-operator.

At Cap L'Aigle the office was closed for the winter on December 1, 1904, and reopened on June 1, 1905, with Miss A. Bergeronnes as agent-operator.

Tadousac-Bergeronnes.—By way of an improvement in the repair service the line in this section, 8 miles, is being replaced by a new stretch along a recently constructed roadway that has been provided by the provincial government.

Saguenay Cable.—The cable crossing the Saguenay river at Tadousac became intermittently interrupted on June 7, 1905, and continued so until July 12, when repairs were made by Mr. Louis Roberge, of Quebec. The trouble was found at the Tadousac landing where the cable had in some way suffered an abrasion.

Roadway clearances, &c.—Several bridges and roadway sections over which the telegraph line passes in the Chicoutimi district and on the North Shore were repaired and put in order in the course of the past season under an appropriation that had been provided for improvements to line repair service.

North shore east of Bersimis :—

Bersimis-Godbout land line.—This line which was mentioned in last year's report had been constructed from Godbout as far west as Scougalls Mills, a distance of forty-five miles, was taken in hand again early as practicable in the course of the past season under the superintendence of Mr. M. W. Crean, now general inspector of the North Shore system. It was found on examination of the westward route that the ground for a long distance was boggy and impracticable for telegraph construction, so the existing line on Manicouagan between Point aux Outardes and Point Paradis with one of the wires of the former loop from Point Paradis to Scougalls Mills was taken in to form part of the through circuit and the further length of thirty-five miles was built from Point aux Outardes up one side of the river to where a crossing was readily effected and down the other side to Bersimis where connection was made

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on August 3, 1905, when the whole land line was put through and has since been in satisfactory operation. It is worthy of notice that on the very night that this new section was completed and connected up, a line of direct communication was required for the accommodation of the astronomers taking observations at Tadousac and Chateau Bay and this was satisfactorily afforded them by means of the through land line with the repeating apparatus at Long Point and at Mutton Bay of which mention was made last year.

Bersimis-Point aux Outardes cable.—This cable gave out on May 12, 1905, and a boat service for the exchange of messages was at once established pending the result of investigation. The trouble was subsequently found by Mr. N. A. Comeau, agent at Godbout, in the shore end near the landing at Point aux Outardes, and the damage was successfully repaired on the 30th of the same month.

General repairs, roadway clearances, &c.—The usual run of general repairs along the line was done in the course of the past season by the several regular repairers or line inspectors with local assistance in their respective sections.

New offices and office changes.—At Sheldrake, Miss A. LeBerge was succeeded by her sister, Mrs. Alphonse Girard as agent-operator, December 1, 1904.

At Egg Island, the establishment of an office was moved for and provision was made at the last session for the requisite cable to connect with the line on the mainland. (Note.—When the ss. *Tyrian* was in the River St. Lawrence this autumn, a cable stretch of one and a half knots was laid to Egg Island, October 2, 1905, and under the foremanship of F. Gallienne, a wire was strung from the landing place to the telegraph office at Penticost, a distance of nine miles and the branch line thus formed was put in operation on October 27.)

At Moisie East, the accommodation office for Messrs. Holliday Bros., was closed on August 1, 1904, and re-opened on April 3, 1905.

At Coxipi, the office and repair station was closed on June 14, 1904, the former agent having gone away. Arrangements are in hand for the opening of a similar agency at Shicataka, a short distance east of Coxipi.

At Blanc Sablon, the office was closed for the winter, and reopened on May 7, 1905.

At Clarke City, the office was closed for the winter, November 10, 1905, and reopened April 15, 1905.

At Baie des Ha, an office was opened on June 14, 1904, with Mrs. Adeline Monger as agent-operator and Jos. Monger as local lineman.

At Betchouan, upon the resignation of the former agent, the office was transferred to Jos. Picard, as agent and local lineman on July 15, 1904.

Belle Isle cable.—The condition of this cable and the wireless telegraph service between Chateau Bay and Belle Isle as mentioned in the last annual report remained unchanged throughout the year. (Note.—An arrangement was made in the autumn with the Marconi Company, whereby their stations at Belle Isle and Point Amour in connection with the Department of Marine and Fisheries, are to be kept in operation through the winter and incidentally the office at Chateau Bay has been temporarily closed, the agent operator, Mr. J. Maloney having been for the interval transferred to the station at Point Amour).

Grosse Isle quarantine line.—On December 28, 1904, the cable between Ange Gardien and St. Pierre gave out and it was found practicable to run a temporary line across the ice, this was done and on January 11, communication was restored and kept up through the winter. There was considerable trouble of an intermittent character in the several cables of this system in the spring (1905), due to damage by the action of moving ice. They were got at as early as practicable and put in repair by Mr. L. Roberge, of Quebec, who had on several previous occasions performed similar service.

Wireless telegraph alternative.—In consequence of the annually recurring damage and interruption to the cables of the quarantine system, it has been considered advisable to turn the method of wireless telegraphy to account in this locality as an alter-

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native to the land line and cable circuit and provision was made at the last session for the establishment of two stations for this purpose. Arrangements have since been made with the Marconi Company at Montreal to the end in view and the work of installation, &c., is now in hand.

## ONTARIO.

**Pelee Island line.**—The Pelee Island cable which was put in working order on June 16, 1904, as mentioned in last year's report, become interrupted again on December 9 as a consequence of an ice crush in the lake across its track. An attempt was made in the month of May to restore communication, but the trouble proved to be in more than one place and completion of the repair had to be deferred pending the arrival of a length of four knots of cable that was being imported under an appropriation provided last session for the purpose of renewing the worn out sections. (This cable was delivered at Leamington in due course and the work was taken in hand by the District Superintendent, Mr. J. McR. Selkirk, who reported a successful repair on October 13, 1905, since when the line has been in satisfactory operation).

**Renewal of telephone apparatus.**—With a view to effecting a general improvement in the operation of the Pelee Island system, all of the offices were equipped in the summer of 1904, with the Standard long distance apparatus of the Bell Telephone Company, the installation was completed by the District Superintendent, Mr. J. McR. Selkirk, on November 16, when he reported the whole in excellent working order.

*New Offices and Office Changes.*

At South Dock, the telephone agency was in August, 1904, returned from Mr. F. W. Ferguson to its original location and has since been in charge of Mrs. F. B. McCormick.

At McIntyres Corners, the telephone station was discontinued in August, 1904. The agent in charge not desiring to continue it any longer.

At Bairds, about midway between Leamington and the lake, an office was established November 2, 1904; and

At Tiddens, about midway of Point Pelee, an accommodation office was afforded by the transfer thereto of the apparatus formerly located at the club-house near by. This change was made in April, 1905.

## NORTH-WEST.

**General inspector.**—As in the cases of the lines in the maritime provinces and of the North Shore St. Lawrence system, a general inspectorship, to which Mr. J. S. Macdonald, formerly district superintendent has been appointed, was created in May last (1905) for the lines in the North-west (Assiniboia, Saskatchewan and Alberta) and all below Ashcroft in south British Columbia including Vancouver island.

**District superintendency.**—The vacancy occasioned by the above appointment has been filled by the transference to Qu'Appelle of Mr. R. C. Macdonald, formerly of the staff at Dawson, Y.T. (Mr. R. C. Macdonald's appointment as district superintendent dates from December 1, 1905.)

**Construction of new lines.**—In the course of the past season, connection was made with Whitford by the construction of a telephone line (seven miles) to Andrew which is reached by a loop off the main line at Victoria as mentioned in last year's report. The telephone at Whitford was placed in the post office, July, 1905.

**Morinville-Legal.**—The locally owned line from Edmonton to Morinville, that was aided by the government at the time of its construction several years ago, was in the course of the past year extended twelve miles to St. Emile of Legal, the government had contributed the line wire, &c., for this extension in 1901, but action was

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deferred by the interested residents and this year, to carry out the work, an expenditure to the extent of \$355 was met by the department (November, December, 1904).

**Renewals of poles.**—In the course of the season some supplies of poles were arranged for under an appropriation made for the purpose last session and laid down where most convenient for distribution along the lines. The result of the inspection made by the district superintendent, as mentioned in last year's report, was the finding that the poles needed renewal only at scattered places, the total numbers called for being 1,450 for the Qu'Appelle-Edmonton line and 500 for the Moosejaw-Wood Mountain section. The most of these poles were placed in position in the course of the past season and the lines are considered to be in good condition for some time to come.

**Office buildings.**—The buildings mentioned in last year's report as being called for in the absence of any obtainable accommodation at Humboldt, Willow Bunch, and Athabaska Landing, were provided for in last year's estimates and are being completed. The one at Athabaska Landing is to furnish room for post office as well.

**Banff Park telephone system.**—Under an appropriation provided last year, this system was thoroughly overhauled and thirteen (13) sets of long distance bridging Bell telephone apparatus were installed in the course of the month of June, 1905, with very satisfactory results and the whole has since been in good and reliable working order.

**Shifting of line to highway.**—The shifting of the telegraph line from off the farm lands to the recently laid out roadway in the vicinity of Moosejaw, in the Wood-Mountain-Moosejaw section as mentioned in last year's report, has been partly done; and under an appropriation provided for the purpose last session, a like action is being taken with the line between Fort Saskatchewan and Star, in the Qu'Appelle-Edmonton division.

*New Offices and Office Changes.*

At Whitford, a telephone connection with the telegraph office at Andrew was established in the post office by a line of seven miles constructed in June and July, 1905.

At Victoria, Mrs. Gordon was appointed agent from February 1, 1905, as successor to Mr. J. C. Gordon, deceased.

*Appointments and Transfers of Linemen.*

At Moosejaw, H. Sykes, former lineman resigned from regular duty as repairer but continues his connection with the service in charge of the main battery and for local line work on occasion in the neighbourhood of Moosejaw. On November 1, 1905, F. Brown, at Wood Mountain, was appointed general repairer for the whole line, Moose-jaw to Wood Mountain and Willow Bunch.

At Bresaylor, Geo. Donovan was appointed lineman and took duty from March 8, 1905.

At Andrew, C. Norn was appointed lineman commencing March 16, 1905. This appointment was called for in consequence of the decease of Mr. J. C. Gordon, late agent and lineman at Victoria.

**Old telephone line between Fort McLeod and Lethbridge, (29 miles).**—In consequence of this line having for a long time been out of use and fallen into decay, the district being covered by extensions of the lines of the local telephone companies it was found advisable to remove what remained of it as in its broken down condition it was dangerous to cattle and otherwise in the way. Accordingly in the spring of 1905, the wire and insulators were collected and bids were invited by posters in the local post offices for the whole of the poles left standing, the highest bid \$50, from Mr. J. V. Thelin, of Orton, was accepted by the Department and the transaction was completed in June, 1905.



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## BRITISH COLUMBIA.

General inspector.—The appointment of a general inspector for the lines south of Ashcroft has been noted in connection with the northwest lines heretofore dealt with.

District superintendency.—The appointment of Mr. C. S. Stevens, of Kamloops, formerly agent for the Kamloops-Nicola line, as superintendent of this line and its later extension to Penticton as elsewhere mentioned, was made dating from June 1, 1905.

## CONSTRUCTION OF NEW LINES.

Lower Nicola to Penticton.—Under an appropriation made for the purpose at the session of 1904, the Kamloops-Nicola line was extended by day labour with Mr. Wm. Henderson, Superintendent at Victoria in charge from Lower Nicola to Penticton via Princeton and Fairview to Penticton, a distance of 168 miles. The poles used in the construction were of the most durable kinds of wood to be had along the route, and where found practicable in timbered sections the standing trees were utilized for supporting the wire, this latter is of No. 6 galvanized iron with insulators of white porcelain. This line was completed in January, 1905, with telephone stations established at the chief objective points as mentioned in the tabular list in the appendix to this report, and at the last session a further appropriation was provided for the equipment of several additional stations and the establishment of local exchanges at Lower Nicola and at Hedley, the number of applications for connections at these places being too great for accommodation together on the main line. (These arrangements were carried to completion in the course of the autumn just past 1905.)

Vernon-Kelowna.—Under a special appropriation provided at the session of 1904 a line was constructed between these points, a distance of 35 miles by day labour in charge of Superintendent Wm. Henderson with the assistance of Mr. R. Swift, of Vernon, and was completed in February, 1905. Arrangements were made subsequently for its being operated both as a telephone and telegraph line as calculated to best serve the local requirements. Connection is made with the C. P. R. Telegraph system at Vernon. A list of the agencies, &c., is given in the appendix to this report. Cedar poles, obtained from the Columbia River Lumber Company at Knolt, near Vernon, were used in the construction of this line and the wire is No. 8 galvanized iron, of which there happened to be a sufficient quantity on hand at Golden since the time of construction of the Golden-Windermere section.

A general inspection of the above lines and examination of the routes for some further extensions that have been applied for in the same district, was made in the course of the spring of 1905, by Mr. J. E. Gobeil, who has since been appointed to a position in the Yukon division as elsewhere noted, and a very comprehensive report covering the whole was communicated by him to the Department under date April 10, 1905.

Kelowna-Penticton.—The construction of a line to fill in the gap, a distance of 45 miles, via Peachland with a stretch of  $1\frac{1}{2}$  miles of cable across a waterway near Vernon was provided for at the last session. Arrangements were made by the local superintendent, Mr. C. S. Stevens, at Kamloops, for the requisite supply of poles of the best wood obtainable along the route and orders have been placed for the requisite wire and cable which will be delivered in time for the resuming of the work early next spring.

## GENERAL REPAIRS, RENEWALS OF POLES, ETC.

Kamloops-Nicola section.—Pursuant to what was stated in last year's report an appropriation was made for the overhauling of the pole line of this section and in the course of the past season the work of re-setting such of the poles as are yet service-



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able, and the putting in of new poles, called for, was performed under the immediate direction of the local superintendent.

Golden-Windermere line.—Nothing beyond ordinary repairs was called for during the past year and this was performed by the regular lineman with local assistance.

For the more satisfactory working of this line which is operated both as a telephone and telegraph line, the latter by connection with the Canadian Pacific Telegraph system at Golden, there was provided at that office in the course of the past season, a special sound proof cabinet with a long distance telephone, the office being too public for the free use of the instrument without this convenience.

At Golden.—Mr. R. N. Young, formerly joint agent for the Canadian Pacific Railway and government lines retired, and was succeeded by Mr. W. A. Decow, December 1, 1904.

Lines on Vancouver Island.—In the summer of 1904, an inspection of the Comox, Alberni and Clayoquot lines was made by Mr. J. G. Brown, of the superintendent's office at Victoria, and the whole found to be in good and reliable condition. Such repairs as have since been called for, have been made by the regular linemen in their respective sections.

At Uchucklesit, ten miles from the Franklin Creek cable crossing, the lineman for the Franklin Creek-Pipestem Inlet section has been stationed and at the office located there, connection was made in March last (1905) by telephone with the Nahmint Mining Company's premises for the convenient handling of messages. A rent of \$2.50 per month is paid by the company for this connection.

Victoria-Cape Beale line.—The conditions of maintenance and operation continue unchanged. No special general repairs have been called for and the line is kept up as continuously as is practicable by the regular linemen in their respective sections; at times of interruption any messages that are in hand are passed round by the Canadian Pacific lines via Victoria or Cape Beale and Bamfield Creek as the case may be.

At Port Renfrew, J. W. Williams succeeded W. G. H. Ellison as lineman on May 1, 1905.

At Clo-oose, lineman O. Rosander left the service on May 30, 1905, and was succeeded by R. S. Daykin, of Carmanah, temporarily appointed to the position.

At Jordon River office, a telephone line with five stations was connected in June, 1905, for the accommodation of several firms in that neighbourhood; and

At Otter Point office, a like connection was made for a line with one station for the accommodation of four separate firms at Sooke wharf for the same purpose. Lists of these connections are given in a tabular statement at the end of this report.

Salt Spring Island line.—Under a special appropriation obtained for the purpose at the last session, a length of  $1\frac{1}{2}$  knots of a suitable type of cable was imported for the restoration of the connection across Sanson Narrows which had been interrupted since July 23, 1904, as mentioned in last year's report. (This new length of cable was duly delivered and was put in position as early as practicable after arrival and communication between all points was restored on August 15, 1905.)

## YUKON.

*(This division includes the Ashcroft-Quesnelle line and branches).*

General inspector.—As in the cases of the lines in the Maritime Provinces, North Shore St. Lawrence system, and the North-west and British Columbia lines, a general inspectorship for the Yukon system was provided for by the appointment on May 9, 1905, of Mr. J. E. Gobeil, formerly connected with the office of the superintendent of construction in the Yukon district. Mr. Gobeil's field of action embraces all of the lines and branches north of Ashcroft.

Main line repairs.—Throughout the year no other line work has been called for beyond what was attended to by the regular staff.

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Such staff changes, &c., as have been made since the list of offices accompanying the last annual report was compiled, are noted in the revised list, or tabular statement, in the appendix hereto.

Branch line repairs.—The branch lines from Quesnelle to Barkerville, sixty-one miles; and Ashcroft to Lillooet, sixty-two miles; having been found to need some general overhauling and resetting of poles as mentioned in last year's report, provision was made for this purpose at the session of 1904, and supplemented for 1905, and these branches have been put in good and reliable order.

### *New Offices and Office Changes.*

At Cache Creek, four miles from Ashcroft, the commission office that was opened in December, 1903, as mentioned in last year's report, was discontinued in May, 1905, owing to the former agent having gone away.

At Bonapart, three and a half miles from Cache Creek, an office taking the place of the former was opened June 23, 1905, with Mr. D. O'Hara in charge.

At Pavillion, on the Ashcroft-Lillooet branch, the commission office, formerly in charge of Mr. R. Cumming was, owing to the latter's going away in March, 1905, transferred and placed in charge of Mrs. Bryson, at The Grange, in the same neighbourhood.

At Forty Mile, near the northern boundary, the purchase was made in July, 1904, of the building in which the telegraph office is located and which it was found advisable to acquire from the owner, Mr. W. T. O'Brien, for the purpose of the service.

Supplementary Report.—The following comprehensive report covering the operation of the Yukon system during the past year is to hand from the acting superintendent:—

VANCOUVER, B.C., Dec. 27, 1905.

D. H. KEELEY, Esq.,  
General Superintendent,  
Government Telegraph Service,  
Ottawa, Ont.

SIR,—I respectfully submit to you herewith my report of the working of the Yukon Telegraph system for the fiscal year ending June 30, 1905.

The revenue and expenditure for the past fiscal year for the main line and branches is as follows:—

	Expenditure.		Revenue.		Deficit.	
	\$	cts.	\$	cts.	\$	cts.
Main Line.....	185,085	02	111,804	02	73,281	00
Port Simpson.....	16,342	92	1,820	22	14,522	70
Barkerville.....	1,575	00	897	09	677	91
Horse Fly.....	1,821	47	823	71	997	76
Lillooet.....	1,708	02	529	00	1,179	02
	206,532	43	115,874	04	90,658	39
Total expenditure.....	\$	206,532 43				
Total revenue.....			\$	115,874 04		
Deficit .....	\$	90,658 39				

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## Comparative statement of revenue and expenditure:—

—	\$ cts.	—	\$ cts.
1903-1904—Revenue .....	126,991 97	Expenditure .....	176,790 15
1904-1905— " .....	115,874 04	" .....	206,532 43
Decreased revenue.....	11,117 93	Increased expenditure ....	29,742 28

## Volume of business :

1903-4.	Number.	Amount.	1904-5.	Number.	Amount.
		\$ cts.			\$ cts.
Messages sent.....	47,982 }	119,238 39	Messages sent.....	47,730 }	109,324 34
" received.....	48,372 }		" received.....	49,966 }	
Press .....	775,358	7,753 58	Press .....	654,970	6,549 70
		126,991 97			115,874 04

As indicated in my report of November 1, 1904, the completion of the United States cable to Sitka and Valdez in October, 1904, has seriously affected the revenue, as since then, practically all the Alaskan business, which was transferred to Yukon lines at Boundary has been diverted to the cable lines at Valdez. The revenue from White Horse was also seriously affected by the completion of the United States cable, as all Juneau and Skagway business for outside points was, previous to the completion of cable, transferred to our lines at White Horse.

The decrease in revenue at Ashcroft, the transfer point with C.P.R. telegraphs, is accounted for by the decrease in Alaskan business transferred at Boundary, Dawson and White Horse.

In order to show the actual decrease in the earnings of the lines for 1904-05, the following will explain fully :—

The receipts for 1903-04 were.. . . . \$126,991 97  
 " " " 1904-05 " .. . . . 115,874 04

Showing a decrease in receipts of.. . . . \$ 11,117 93

The receipts for 1903-04, \$126,991.97, are made up of :—

Earnings.. . . . \$126,520 49  
 Outstanding accounts paid during year.. . . . 471 15  
 Paid on account error statements.. . . . 0 33

\$126,991 97

The amount of \$471.15 paid in on account of outstanding accounts is determined by \$1,179.97 of outstanding 1902-03 carried forward to 1903-04 less amount of outstanding 1903-04; \$708.82 carried into 1904-05, making \$471.15, as above.

The receipts for 1904-05, \$115,874.04, are made up of :—

Earnings.. . . . \$115,783 49  
 Outstanding accounts paid during year.. . . . 90 55

\$115,874 04

The amount of \$90.55 paid in on account of outstandings is determined by \$708.82 outstanding of 1903-04 carried to 1904-05 less outstandings of 1904-05, \$618.27 carried to 1905-06, making \$90.55, as above.

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The difference in revenue, \$11,117.93, is made up of decrease in earnings, \$10,737.00, and difference between amounts paid in on account of outstandings and error statements of the respective years of \$380.93, thus making the decrease in receipts, \$11,117.93.

The following offices show the principal increases and decreases in earnings :—

DECREASES.	
Ashcroft.. . . . .	\$ 6,931 31
Quesnelle.. . . . .	142 39
Atlin.. . . . .	850 39
Dawson.. . . . .	2,358 01
Forty Mile.. . . . .	551 19
Selkirk.. . . . .	142 04
White Horse.. . . . .	5,780 26
Yukon Crossing.. . . . .	241 08
Other offices.. . . . .	608 06

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\$17,604 73

INCREASES.	
Bullion.. . . . .	\$ 190 63
Hazelton.. . . . .	242 08
Telegraph Creek.. . . . .	132 17
Lorne Creek.. . . . .	113 19
Aberdeen.. . . . .	301 70
Port Simpson.. . . . .	322 70
Boundary.. . . . .	5,114 08
Other offices.. . . . .	451 57

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\$6,867 73

Decrease in earnings.. . . . .	\$17,604 73
Less increase.. . . . .	6,867 73

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Net decrease.. . . . . \$10,737 00

The increase in the Boundary revenue was all in the first part of the year previous to the completion of the United States cable, as after that date the receipts fell very far below the average, and the prospects are that the decrease will be more marked for the current year 1905-06, as the Alaskan business for the first four months 1905-06 swelled the revenue to a large extent, and this year there is nothing to depend upon for revenue except business originating at and destined for points on Yukon lines.

Expenditure.. . . . .	\$206,532 43
Made up as follows :—	
Salaries.. . . . .	\$123,204 79
Provisions and supplies.. . . . .	28,785 10
Freight, packing and transportation charges.. . . . .	29,075 79
Sundry expenses, rent, fuel, light, board of employees, repairs to trails, &c.. . . . .	14,686 92
Repair to main line.. . . . .	4,818 55
“ “ Barkerville.. . . . .	758 00
“ “ Lillooet.. . . . .	853 39
New cabins.. . . . .	655 68
Old accounts 1901-02.. . . . .	3,387 61
Burial expenses.. . . . .	82 60
Inspection account.. . . . .	224 00
	<hr/> \$206,532 43

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In explanation of the expenditure of 1904-05, of \$206,532.43. This expenditure includes liabilities incurred previous to 1903-04, amounting to \$3,387.61 and 1903-04 accounts unpaid at June 30, 1904, amounting to \$25,061.05, making a total of \$28,448.66 or a net expenditure for 1904-05, of \$178,083.77.

The difference between the amount of liabilities incurred in operating the line 1903-04, \$195,770.55, and the actual expenditure for that year, \$176,790.15, viz., \$18,980.40 added to the amount of 1902-03 accounts paid out of the appropriation for 1903-1904, \$6,080.65 or a total of \$25,061.05 explains why accounts of 1903-04 to that amount remained unpaid at June 30, 1904.

The service on the line has been fairly well maintained considering the exceptional conditions under which it is operated, such as length of line, nature of country through which the line passes, sparseness of population, &c. The greatest trouble is experienced between First Cabin, north of Hazelton, and Echo Lake, as the line at these points comes within the coast range, and is subject to very heavy falls of soft snow and sleet; in the late fall and early part of the winter, north of Echo Lake, the snow fall is great but of dry nature that does not cause any great amount of wire trouble. South of First Cabin, the line passes through a fairly open country where the snow fall is comparatively light, and very little trouble is experienced in keeping communication open south of First Cabin.

The whole line from Quesnelle to northern boundary, has been thoroughly gone over and all temporary repairs made during the winter have been made permanent, decayed poles renewed and everything put in good shape for the winter.

Owing to the unsatisfactory manner in which the business at White Horse was performed, Mr. A. B. Clegg, district superintendent, was suspended in June last; since then, his duties have been performed by Mr. Gilchen, pending action of the department on my report of August 25th last.

The services of several operators and linemen have been dispensed with during the past year for neglect of duty, but with these exceptions the duties devolving upon the employees of the line have been performed in a satisfactory manner.

Your obedient servant,

(Sgd.) J. Y. ROCHESTER.

## TARIFF CHANGES.

Press rate.—In April, 1905, the former rate of one cent per word with minimum charge of \$1 for the whole line was modified as hereunder :—

On the Yukon line 1 cent per word, minimum charge \$1. This applies to the whole line. Exception, Barkerville—Ashcroft section (local) minimum charge, 50 cents.

## TELEGRAPH SERVICE GENERALLY.

Inspectorships.—As noted elsewhere in this report under the several divisional headings, four general inspectors have been appointed with a view to enhancing the efficiency and usefulness of the service.

Cable ship.—The ss. *Tyrian* in command of Captain T. O'Leary, with Mr. R. G. Zwicker, chief engineer; Mr. W. McConnell, pilot; and the other officers and members of the crew for most part the same as in 1903 and last year, was this year, 1905, not available for service until the month of September in consequence of some extensive repairs and changes of her machinery, and arrangements for accommodation for the officers and crew, that could not be put in hand early in the season in the absence of the requisite funds for the purpose. As early as practicable, however, the

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needful work was provided for and the ship was got ready for sea. The work performed, in the interval, until the season was too far advanced for its continuance will be found noted under the several divisional headings. This year as last, Mr. A. B. McDonald, of Meat Cove, Cape Breton, acted in the capacity of electrician in connection with the work of cable laying and repairing that was in hand.

NOTE.—It is regrettable to have to mention the sad circumstance of an accident happening in boiler room of the *Tyrian* when about two miles off Meat Cove, on October 28, 1905, in the course of repairs to the Magdalen Islands cable, whereby through the blowing out of a safety plug two of the firemen were fatally injured by the escaping gas and steam. One of the unfortunate men, P. Purcell, died on the way to Sydney, for which port the ship was headed as soon as possible after temporary repairs were made by the engineers; and the other, P. McGrath, passed away shortly after the ship's arrival there. The bodies were subsequently conveyed by railway to Halifax, in charge of a member of the ship's company and the funeral arrangement were seen to by the resident engineer on behalf of the department.

After some further examination and repairs, the vessel was adjudged to be in a safe condition by the several officers concerned, and on November 8, an authorization was given for her again proceeding with the work that was in hand, and on the 16th the cable was repaired and connection with the Magdalen Islands restored. The ship then returned to Halifax to go into winter quarters.

*Telegraph Systems of the Dominion.*—As a matter of general interest the latest figures to hand showing the extent of telegraph lines in operation in the Dominion are given hereunder:—

Canada.	LENGTH OF LINES IN MILES.			LENGTHS OF CONDUCTORS IN MILES.			Number of offices.
	Aerial.	Under-ground.	Total.	Aerial.	Under-ground.	Total.	
Great North Western Telegraph Co. ....	18,286	.....	18,286	35,721	.....	35,721	1,455
Canadian Pacific Telegraphs....	10,292	2	10,294	50,952	57	51,009	1,150
Western Union Telegraph Co....	2,610	28	2,638	9,805	44	9,849	219
Government Telegraph Service..	6,590	.....	6,590	6,590	.....	6,590	337

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## REVENUE AND EXPENDITURE.

The revenue and expenditure for each of the Government lines in the several districts hereinbefore mentioned are given in the following table :—

1904-05.	Expendi- ture.	Revenue.	Remarks.
	\$ cts.	\$ cts.	
Lower St. Lawrence and Maritime Provinces :—			
Anticosti lines.....	5,083 47	1,145 17	
Bay of Fundy.....	2,107 31	882 55	
Cape Ray.....	250 00		
Escuminac.....	755 67	148 32	
Magdalen Islands.....	3,073 34	1,179 11	
Father Point Agency.....	500 00		
Cape Breton lines.....	10,254 45	2,754 28	
North Shore (E. B.).....	15,333 50	4,086 06	
" (W. B.).....	8,723 17	1,764 01	
Quarantine system.....	4,158 04	344 13	
Isle aux Coudres.....	150 00		
Cable ship <i>Tyrian</i> :—			
Maintenance and renewal of plant.....	37,572 56		
Subsidies, stationery, line and office material and contingencies.....	12,162 89		
Total for Lower St. Lawrence, &c.....	100,124 40	12,304 63	
Ontario :—			
Pelee Island line.....	3,325 34	137 25	
North-west Territories lines.....	30,703 68	5,976 91	
British Columbia :—			
Alberni-Cape Beale.....	774 00	10 59	
Alberni-Clayoquot.....	3,134 34	391 14	
Golden-Windermere.....	3,186 62	700 13	
Kamloops-Nicola.....	861 03		
Nicola-Penticton.....	192 20	1,400 40	
Nanaimo-Comox.....	3,443 38	2,307 93	
Vancouver-Salt Spring.....	174 46	4 77	
Vernon-Kilowna.....	292 15	343 19	
Victoria-Cape Beale.....	4,826 78	305 32	
B. C. service generally.....	1,354 62		
Yukon :—			
Ashcroft-Dawson.....	229,351 05	115,876 18	
Telegraph service generally.....	2,263 23		
Total.....	384,007 28	139,758 44	

Signal Service messages, Meteorological Service messages and reports, and Fisheries bulletins are handled free of tolls.



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## DEPARTMENTAL TELEPHONE SERVICE.

At the end of June, 1905, the telephone connections with the central offices of the Bell Telephone Company at Ottawa, listed as chargeable to the special appropriation, numbered 258, the annual charge for which amounted to \$10,299; and at the end of the present month (December, 1905) numbered 266, amounting to \$10,680. The connections are distributed amongst the several departments as hereunder :—

Department.	Offices.	Residences.	Annual charge.
			\$ cts.
Agriculture.....	7	4	435 00
Auditor General.....	3	1	150 00
Census Branch.....	1		50 00
Customs.....	5	2	290 00
Dominion Police.....	6	3	363 00
Exchequer Court.....	1	2	105 00
Finance.....	6	2	283 00
Governor General (including private system).....	3	2	362 75
House of Commons.....	14	3	687 50
Indian Affairs.....	4	1	190 00
Inland Revenue.....	4	5	408 00
Interior (including line to Observatory).....	26	3	1,165 00
Geological Survey.....	2	1	110 00
Justice.....	6	10	628 00
Labour Department.....	1		50 00
Mounted Police.....	3	1	145 00
Marine and Fisheries.....	10	5	563 00
Militia and Defence.....	10	11	797 00
Parliamentary Library.....	1	2	120 00
Privy Council.....	3	5	335 00
Post Office Department (including Ottawa River Works).....	5	5	385 00
Public Works (including Ottawa River Works).....	32	15	1,948 00
Printing and Stationery.....	3	2	190 00
Railways and Canals.....	3	5	305 00
Secretary of State.....	3	2	180 00
Senate.....	5	1	215 00
Trade and Commerce.....	3	3	220 00
	179	96	10,680 25

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## APPENDED TABLES.

The usual tabular statements of the lines and offices, staff, &c., of the telegraph service, following hereupon, will be found to contain whatever additions or changes have been made up to June 30, 1905.

D. H. KEELEY,

*General Superintendent.*

OTTAWA, December 28, 1905.

## DOMINION TELEGRAPH SERVICE.

## NEWFOUNDLAND TELEGRAPH SERVICE.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.		Memo.
		Miles.	\$	cts.	
1	Port au Basque.....	0	50 00	on commission	N.B.—The commission is 25 per cent upon all business to and from the office; said commission guaranteed not to be less than at the rate of \$50 per annum.
2	Cape Ray Lighthouse.....	14	50 00	"	
	Totals.....	14	100 00		

N.B.—The above short line is constructed in connection with the Signal Service, and connects at Port au Basque with the land line system of the Anglo-American Telegraph Company.

## GOVERNMENT TELEGRAPH SERVICE—Continued.

## ANTICOSTI TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Fox Bay.....	0	(Geo. Cabot .....	300 00	May 13, 1900.....	Increased from \$200 since December, 1902.
2	Heath Point.....	23	(A. Tremblay.....	50 00 on commission.	Aug. 1, 1900.....	For local agency.
3	South Point Lighthouse.....	32½	F. Leprieu.....	200 00 "	Nov. 1, 1902.....	For cable repeating station.
4	Shallot Creek.....	17½	B. Bradley.....	50 00 "	July 1, 1903.....	
5	Salt Lake.....	52½	A. Allard, agt. repairer	240 00 "	July 7, 1881.....	
6	South-west Pt. Lighthouse.	15½	A. Z. Lemieux.....	360 00 "	June 1, 1903.....	Plus \$1 per day when on duty as general repairer.
	Jupiter River.....	7		420 00 "	" 1, 1901.....	Increase from \$300 since May, 1903.
	Otter River.....	17½		50 00 "		
	Beacoe River.....	22		50 00 "		
	Cape Eagle (Ellis Bay).....	10		50 00 "		
7	West Point Lighthouse.....	9	(A. Malouin, dist. supt.	344 00 per annum.	Aug. 1, 1900.....	
8	English Bay.....	3	" operator.....	50 00 "	Aug. 10, 1881.....	
	Mechastic Bay (cable land- ing).....	14½	F. Cabot.....	120 00 and commission	July 1, 1882.....	
	Totals.....	223½		2,334 00		

South-west Point connects with l'Anse à Fongère, Gaspé, by cable 44½ knots; and from Mechastic Bay connection is made with Long Point of Mingan by cable 21 knots.

0	L'Anse à Fongère.....		Thos. Dupuis.....	17 00	.....	Special allowance for the cable terminus. A testing station only*.
1	Gaspé Basin.....	28	J. J. Annett.....	540 00	Oct. 16, 1881.....	Transfer office. Connection with G. N. W. telegraph system. The salary was \$420 per year previous to December 1, 1903.
		28		537 00		

\* This payment was made to Mr. N. Bernier prior to October, 1903.

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## MAGDALEN ISLANDS SYSTEM.

## MAGDALEN ISLANDS SECTION.

1	Ankerst. ....	0	Miss J. Shea .....	50 00 or commission ..	Oct. 1, 1882 ..	The commission is 25 per cent on all business to and from the office in each instance; said commission guaranteed to be not less than at the rate of \$50 per annum.
2	Amherst Lighthouse .....	9	Wm. Cornier .....	50 00	June 11, 1881 ..	Plus \$1 per day when absent on duty.
3	Etang du Nord village .....	15	( L.G. Bisset, gen. repairer Mrs. A. Binet .....	400 00	Dec. 1, 1900 ..	Two-wire loop line.
4	Etang du Nord Lighthouse .....	1	N. Arsenault .....	50 00	Sept. 1, 1891 ..	Plus \$1 per day when absent on duty. The salary was \$500 per annum prior to May 1, 1904.
5	Grindstone Island .....	5	W. Leslie .....	Commission 25 p.c.	May 20, 1897 ..	
6	Grindstone West .....		( A. LeBourdais, disupt. Mrs. LeBourdais, oper. ....	720 00	Aug. 17, 1880 ..	
7	Houase Harbour (½ knot cable) * .....	3	Camille Delaney .....	50 00 or commission ..	Sept. 15, 1893 ..	
8	Wolfe Island .....	28½			June 1, 1903 ..	
9	Grosse Isle .....	11	( N. Clark .....	300 00 or commission ..	June 1, 1888 ..	For repeating station. Prior to Dec. 1, '02 the allowance was \$200 and commission for local agency.
10	Grand Entry .....	11	( J. Quinn .....	50 00	Dec. 1, 1902 ..	
11	*Point Rasse—2 Wire loop from House Harbour .....		Mrs. F. Atkins .....	50 00	Feb. 18, 1882 ..	
12	South Beach—2 Wire loop .....	4	H. Arsenault .....	50 00	Aug. 1, 1902 ..	
13	Bryon Island .....	3	E. Chevrier .....	50 00	July 1, 1905 ..	Two-wire loop line from terminal hut for Grosse Isle and Anticosti cables.
		1	W. Dingwell .....	150 00	Jan. 1, 1903 ..	
		91½		2,130 00		

Grosse Isle connects at Old Harry with West Cove, C.B., by cable 55 knots; and connects with Bryon Island by cable 11 knots; thence to Heath Point Anticosti 93 knots.

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GOVERNMENT TELEGRAPH SERVICE—Continued.  
CAPE BRETON SECTION.

No.	Stations.	Inter- mediate, Distance	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Mile		\$ cts.		
1	Meat Cove (cable station).		A. B. McDonald, Circuit Manager .....	720 00	Nov. 7, 1880.	The commission is 25 p.c. on all business to and from the office in each instance; said commission guaran- teed to be not less than at the rate of \$50 per annum.
2	Aspy Bay .....	10 $\frac{1}{2}$	I. Y. Nichols .....	50 00 or commission	July 1, 1894	The loop line formerly running to White Point has been withdrawn.
3	Dingwall (loop line).....	3 $\frac{1}{2}$	Murdoch McLeod.....	50 00	Aug. 31, 1898	
4	Cape North (Inland).....	2 $\frac{3}{4}$	John McDonald .....	50 00	May 13, 1904.	
5	Neil's Harbour (half-way house loop line).....	11 $\frac{1}{2}$	M. McLeod .....	50 00	April 1, 1887.	
6	Ingonish North Bay.....	9	Mrs. S. S. Burke .....	50 00	June 1, 1884.	Former Agent J. M. Burke deceased.
7	South Ingonish .....	10 $\frac{1}{2}$	Geo. Brewer .....	50 00	May 7, 1899	
8	Ingonish Ferry .....	2	Anna McLeod .....	50 00	Oct. 1, 1903	
9	French River $\frac{1}{4}$ knot cable.	21	John McDonald .....	50 00	April 1, 1899	
10	Indian Brook .....	5	Annie McDonald .....	50 00	Aug. 1, 1901	
11	Murray (loop line).....	14	R. B. Mathieson .....	25 p. c. R & Cks.	Jan. 29, 1902.	25 per cent commission only.
12	Englishstown $\frac{1}{4}$ knot cable..	10	W. Bingham.....	120 00 and commiss.	July 19, 1882.	Switching point for Baddeck line.
13	South Gut, St. Ann's (on loop) .....	5	Rachael Morrison .....	50 00	Sept. 1, 1904.	Closed December 31, 1899.
14	Baddeck (on loop).....	13	L. M. Anderson .....	100 00	June 17, 1904	Salary—\$120 per year previous to this appointment. Former Agent Mr. A. Anderson. This loop to Baddeck starts from and returns to Englishstown.
15	Englishstown (back on loop) bellion .....	18	J. S. Burchell .....	50 00 or commission	July 7, 1904.	
16	Kelley's Cove, N. Camp- bellton .....	6	Mrs. E. Livingston .....	100 00	Jan. 1, 1889.	The commission is 50 p.c. on local business and 25 p.c. on through messages; and covers supervision of line and office accommodation at North Sydney.
17	Big Bras d'Or $\frac{1}{4}$ knot cable. North Sydney .....	24 12 $\frac{1}{2}$	W. U. Tel. Co.....	Commiss'n only		
<i>Repairs' Sections.</i>						
	Meat Cove—Sugar Loaf.....		M. McAskill .....	80 00	April 1, 1898	
	Sugar Loaf—Ingonish.....		Charles Smith .....	100 00	" 1, 1898	
	Ingonish—Englishstown.....		R. A. McDonald .....	100 00	" 1, 1898	
	Englishstown—Baddeck.....		D. McAnlay .....	60 00	Nov. 1, 1904	
	" North Sydney .....		Dan Campbell.....	100 00	July 14, 1903	
	Murray—Indian Brook .....		John Smith.....	25 00	June 17, 1902	
	Ingonish.....		S. S. Burke, gen. repr.....	420 00	April 1, 1904.	Payment includes horseshoe.
Totals.....		168 $\frac{1}{2}$		2,525 00		

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<i>Beauch Line.</i>				\$ cts.		
0	Big Bras d'Or.....	Mrs. E. Livingston.....	July 1, 1899.	100 00		The commission is 25 p.c. of the Govt. line tolls in each instance and is guaranteed to amount to not less than \$50 per annum.
1	Bonlatarie Centre.....	Mrs. J. B. McKenzie.....	Oct. 6, 1904.	50 00 or commission		
2	Ross Ferry.....	Miss Joliana Campbell.....	" " 6, 1904.	50 00		
3	Upper Kempt Head.....	Mrs. Murdoch McKenzie.....	" " 6, 1904.	50 00		
Totals.....				250 00		
Meat Cove station connects with the Magdalen Islands system by a cable to Old Harry Head, 55 knots, and with St. Paul's Island by a cable of 20 knots. The latter is operated with telephones.						
1	St. Paul's Island.....	S. C. Campbell.....	Oct. 1, 1890.	50 00		Land wire across the Island, Atlantic Cove to Trinity Cove.
MAROU-CHETICAMP AND MEAT COVE, C.B., TELEGRAPH SYSTEM						
1	Mabou.....	Mrs. M. McDonald.....	April 1, 1887.	120 00 per annum...		The commission is 25 p.c. of the Government line tolls, and is guaranteed to amount to not less than \$50 per annum. Where 50 p.c. commission is paid there is no guarantee as to amount.
2	Inverness Town (Broad Cove).....	Miss Annie McLelland.....	Mar. 1, 1892.	50 p.c. Cks. & Rts		
3	South-west Margaree.....	J. D. McFarlane.....	Feb. 1, 1898.	50 00 per annum...		
4	Margaree Harbour.....	H. K. McLean.....	Oct. 20, 1896.	50 p. c. R. & Cks		
5	North-east Margaree (loop line wire).....	Mrs. J. D. Ross.....	Feb. 1, 1898.	50 00 or commission		
6	Grand Etang.....	G. Doudet.....	Sept. 13, 1902.	50 00		Closed March 31, 1905.
7	Cheticamp.....	M. Aucoin.....	Aug. 3, 1905.	50 00		
8	Pleasant Bay.....	M. J. McIntosh.....	Oct. 15, 1903.	50 00		
9	Cape St. Lawrence.....	C. Jamieson.....	Jan. 1, 1904.	50 00		
	Meat Cove.....	(See Meat Cove Line...)	" 1, 1887.	150 00		
<i>Requiere's Sections—</i>						
	Mabou—Strathlorne—Strathlorne—S. W. Margaree.....	L. G. McInougall.....	Nov. 3, 1902.	40 00 per annum...		
	S. W. Margaree—Margaree Harbour.....	J. D. McFarlane.....	June 4, 1902.	40 00		
	Margaree Harbour—Grand Etang.....	Alex. McFarlane, sr.....	" 4, 1902.	40 00		
	Cheticamp.....	H. K. McLean.....	" 1, 1903.	25 00		
	Cheticamp—Barren.....	Joseph L. Chiasson.....	" 1, 1905.	40 00		
	Barren—Pleasant Bay.....	Moses Aucoin.....	May 20, 1903.	40 00		
	Pleasant Bay—Polits Cove.....	J. A. McLean.....	" 20, 1903.	40 00		
	Polits Cove—Halfway Shanty.....	K. Fraser.....	" 20, 1903.	40 00		
	Halfway Shanty—Meat Cove.....	E. Fraser.....	" 20, 1903.	30 00		
	General lineman.....	R. Fraser.....	" 20, 1903.	40 00		
		V. A. McLellan.....	Mar. 1, 1905.	420 00		Salary covers horse-hire, &c.
Totals.....				1,365 00		

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GOVERNMENT TELEGRAPH SERVICE—Continued.  
NORTH SYDNEY—MEAT COVE AND PORT HAWKESBURY SECTION.

Number.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salary per annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Mabou .....	0	D. J. McDonald .....	50 00*	July 1, 1903.	(See Mabou.—Meat Cove section.)
2	Port Hood .....	10	Mrs. McDonald .....	50 00	" 1, 1904	
3	Indique .....	8	J. D. Cameron .....	50 00	" 1, 1903.	
4	Craignish .....	10	Miss M. McFarlane .....	50 00	" 1, 1903.	
5	Port Hastings .....	33 $\frac{1}{2}$	Miss E. McDonald .....	120 00	" 1, 1903.	
6	Port Hawkesbury .....	26	Angus Boyd .....	50 00	" 1, 1903.	
7	River Bourgeois .....	6	D. Morrison .....	100 00	Nov. 1, 1903.	Main battery at St. Peters.
8	St. Peters .....	74	Miss Mary D. Finlayson .....	50 00	June 22, 1905	
9	Lower Lardiose ( $\frac{1}{2}$ mile loop) .....	7	Miss Jessie Finlayson .....	50 00	" 1, 1903.	
10	Fouchin .....	26	Miss May Hardy .....	50 00	" 1, 1903.	
11	Gabarus (3 mile loop) .....	16	Miss C. Grant .....	180 00	Jan. 16, 1904.	Repeating office.
12	Louisbourg .....	14	Wesley Townsend .....	50 00	Feb. 1, 1904.	
13	Main à Dieu .....	13	Miss Maud Dickson .....	50 00	June 1, 1904.	\$50 additional to Main à Dieu agency for care of main battery.
	To cable landing .....	1				
	Cable across channel .....	1 $\frac{1}{2}$	{ E. E. Pope .....	50 00	Aug. 15, 1904	
14	Scatarie Island (Western Light) .....		{ J. T. Martel .....	50 00	" 1, 1904.	
15	" (Eastern Light) .....	74				
	General lineman Port Hawkesbury and Meat Cove Section .....		Wm. J. Smyth .....			(See Mabou.—Meat Cove section.)
	Branch.					
	Gabarus .....					
	Junction (wire only, 3 miles) .....					
	Marion Bridge .....		No appointments, only the terminal offices in operation.			This line was opened for business Dec. 11, 1903.
	Perry Lewis .....	35 $\frac{1}{2}$				
	Letchie's Creek .....					
	North Sydney .....					
	Totals .....	202 $\frac{1}{2}$		930 00		

\* Or commission. The commission is 25 per cent of the Government line tolls, guaranteed at rate of \$50 per annum. North Sydney transfer office, connection with W. U. Telegraph system.



NOVA SCOTIA TELEGRAPH SYSTEM.  
CAPE SABLE SECTION.

1	Barrington .....	0	
2	Newellton (including 1½ knots cable).....	11	
3	Cape Sable Island light-house (including ¾ mile cable).....	6¾	
	Totals.....	17¾	

This line has been leased to the Barrington Telephone Company from August 12, 1897. The lease is terminable at any time.

## EAST COAST SECTION.

N. B. — In connection with the Signal Service a land line, 208 miles in length, was erected in 1881, between Canso and Halifax, for a bonus of \$16,000, and is maintained and operated by the Western Union Telegraph Company, without further cost to the Government.

## BAY OF FUNDY, N.B., TELEGRAPH SYSTEM.

GRAND MANAN SECTION.

Long Eddy Cable Hut to.							
1	Flagg's Cove.....	3	Mrs. C. C. Seely (D. Su.)	540 00	Nov. 18, 1880 ...		
	"		Miss V. A. McFarlane	50 00 or commission..	Oct. 1, 1903 .....		
	"		A. Gilmour, repairer..	60 00	Dec. 1, 1894 .....		
2	Castalia.....	2½	G. E. Dalzell.....	Commission 25 p.c.*	June 1, 1898.....		
3	Woodward's Cove.....	3½	W. A. Fraser.....	50 p.c.	Feb. 28, 1893.....		
4	Seal Cove.....	2	J. L. Newton.....	75 00 or commission.	April 1, 1887.....		
5	Grand Harbour.....	4½	J. A. Ingersall.....	"	Sept. 22, 1899.....		
6	Southern Head Lighthouse	5½	O. McLaughlin.....	Commission 25 p.c.	April 24, 1897.....		
<i>Branch Line.</i>							
7	Grand Harbour.....	0					
	Cheney's Island (½ knot cable).....	4¾	W. Cheney.....	" 25 p.c.	Feb. 1, 1891.....		
8	Whitehead Island (¾ knot cable).....	1½	Mrs. W. Caseboom...	50 00 or commission..	" 1, 1903.....		
	Cable, Long Eddy to Liberty Cove.....	7¼					
<i>Liberty Cove Cable Hut to.</i>							
9	Waldpool.....	7½	G. E. Mitchell.....	210 00 and commission.	May 1, 1905.....		
10	Cable across channel, Eastport, Maine, U.S.A....	1¾	J. Cushing.....	200 00	Dec. 26, 1881.....		
Totals		44½		1,035 00			

The commission is 25 p.c. on all business to and from the office in each instance; and commission guaranteed not to be less than at the rate of \$60 per annum. When 50 p.c. commission is paid there is no guarantee as to amount.

\$25 per annum is included for repeating Whitehead branch.  
Southern head office is now operated by telephone from Seal Cove.\*

GOVERNMENT TELEGRAPH SERVICE—Continued.  
CHATHAM-ESCUMINAC, N. B., TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		£ cts.		
1	Chatham .....	0	Great North-western Telegraph Co. ....	185 00		This amount is paid for supervision of the line and office accommodation at Chatham.
2	Black Brook .....	5½	M. McDougall .....	50 00 or commission...	July 1, 1904.	The commission is 25 p.c. of the Government line tariff receipts in each instance, and is guaranteed to amount to not less than \$50 per annum.
3	Pate du Vin .....	15	Mrs. M. Williston .....	50 00 "	Mar. 1, 1885.	
4	Lower Hardwicke .....	6	Mrs. M. Brunner .....	50 00 "	Aug. 1, 1891.	
5	Pennuac .....	3¾	D. Lewis .....	50 00 "	Sept. 1, 1885.	
6	Point Escuminac lighthouse	12	K. R. McLennan .....	50 00 "	Nov. 1, 1893.	\$12 per annum allowed for care of main battery at Point Escuminac.
	Totals. ....	42		435 00		

GROSSE ISLE QUARANTINE TELEGRAPH SYSTEM.

1	Quebec.	0	Great North-western Telegraph Co. ....	185 00		This amount is paid for supervision of the line, and covers rent of pole line from Quebec to L'Ange Gardien, for which \$35 per annum is charged.
	<i>L'Ange Gardien.</i>	13				This commission is 25 p.c. of the Government line tariff in each instance, and guaranteed to amount to not less than \$50 per annum.
2	St. Pierre.	4½	C. Turcotte .....	50 00 or commission...	Mar. 1, 1885.	
3	St. Petrouille .....	3¾	M. Plante .....	50 00 "	April 7, 1896.	
4	St. Laurent.	6½	M. Gobeil .....	120 00 and 25 per cent commission.	Sept. 15, 1888.	
5	St. Jean .....	7	P. Pouliot .....	120 00 and 25 per cent commission.	July 1, 1888.	For local agency.
				480 00 per year.	May 1, 1902.	Chief operator and repairer.
6	St. François.	6¾	O. Lemelin .....	50 00 or commission...	" 15, 1900.	
7	Isle Reaux (including knots cable).	2				
	Isle Reaux (land line).	34				
8	Grosse Isle quarantine office (including 2 knots cable).	2½				
	Quarantine telephone sys- tem 2 wire line.	3½	M. D. Masson .....	100 00 and 25 per cent commission.	May 1, 1902.	\$4 per month for messenger serv. in summer, and \$12 p. annum allowed for care of main batt. at Gr. Isle, Nore.—The telephone system on Grosse Isle since May, 1893, has comprised 1½ miles of 2 wire line with 11 connections or stations.
	Totals. ....	13		1,155 00		

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## CHICOUTIMI AND NORTH SHORE OF ST. LAWRENCE TELEGRAPH SYSTEM.

## CHICOUTIMI SECTION.

Loop Line (2 wires.)	St. Jean-St. Famille. ....	5½	P. Létourneau.....	50 00 or commission..	April 2, 1904.....
1 Bay St. Paul.....	F. Boivin.....			180 00 per annum..	Previous to
2 St. Urbain.....	(A. Boivin.....	9		25 p.c. commission ..	April 1, 1885.....
3 La Gaiette.....	(A. Gauthier, repairer	37		50 00 or commission..	" 1, 1885.....
4 St. Alexis.....	S. Ouellette.....	37½		210 00	May 15, 1887.....
5 St. Alphonsé de Bagotville	Mrs. D. Simard.....	3		100 00	Aug. 25, 1902.....
6 Chicoutimi.....	A. Simard.....	11½		50 00 or commission..	Nov. 1, 1899.....
	(G. N. W. Telegraph C.			50 00	Nov. 1, 1885.....
	(J. Fortin, repairer.....			25 p.c. commission..	Nov. 1, 1893.....
		98		420 00 per annum.....	June 1, 1897.....
				1,060 00	
<i>Branch Line.</i>					
7 St. Alexis.....	Mrs. D. Simard.....	0			
8 L'Anse St. Jean.....	Rev. H. Neron.....	10		50 00	Nov. 1, 1903.....
9 Petite Saguenay.....	(J. Martel, repairer.....	30		210 00	May 1, 1904.....
10 Anse Clerval.....	(R. Martel.....	8		50 00	Jan. 1, 1904.....
11 St. Etienne.....	M. Tremblay.....	6		50 00	Sept. 1, 1903.....
St. Catharines Bay.....	Jos. Degagné.....	7		50 00	Feb. 1, 1905.....
	G. Boudreau (see North	17			
	Shore W. B. Lane.)				
		78		410 00	
Totals.....		176		1,470 00	

"The commission on business is 25 per cent of the Government tolls of the line; the amount guaranteed to be not less than \$50 per annum.

Plus \$25 per year for operating branch line to L'Anse St. Jean.

Plus \$12 per annum for care of main battery.  
J. Fortin's division includes the branch line to L'Anse St. Jean.

(This office had been closed since April 30, 1904.)

## MURRAY BAY—ST. AGNES SECTION.

1 Murray Bay.....	Mrs. F. Vincent.....	0			(See Murray Bay, Bersimis section.)
2 St. Agnes.....	Jos. Gaudreau.....	7½		50 00	Jan. 1, 1904.....
Trinity (Guay).....	Jos. Guay.....	7		50 00	Dec. 1, 1903.....
		14½		100 00	
Bay St. Paul.....	F. Boivin.....	0			(See Bay St. Paul, Chicoutimi section.)
Petite River.....	J. Bouchard.....	13		50 00	(Payment at Bay St. Paul \$25 per year and \$12 for battery care, for operation of this branch to Petite River.
		13		50 00	

Connections for these lines with the G. N. W. Telegraph System are made at Chicoutimi, Bay St. Paul and Murray Bay.

GOVERNMENT TELEGRAPH SERVICE—Continued.  
CHICOUTIMI AND NORTH OF ST. LAWRENCE TELEGRAPH SYSTEM—Continued.  
CHICOUTIMI SECTION—Continued.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	St. Charles .....	0	B. Boucher .....	50 00	Sept. 1, 1903.	
2	St. Ambrose .....	10	A. Simard .....	50 00	June 1, 1905	
3	St. Leonard .....	7	Geo. Gagnon .....	50 00	Sept. 1, 1903	
4	Shipslaw, North .....	6	J. Murdoch .....	50 00	" 1, 1903.	
5	Shipslaw .....	3	Aug. Dufore .....			
6	St. Anne .....	8	P. Gauthier .....	200 00	Aug. 1, 1903.	
	<i>Chicoutimi.</i> .....	3	G. N.W. Telegraph Co.			
		37		400 00		
	<i>Branch Line.</i>					
1	St. Anne .....	0	P. Gauthier .....	50 00	Jan. 1, 1904	(See St. Charles.—Chicoutimi section.)
	St. Fulgence .....	9	Rev. Geo. Gagnon .....	50 00		
		9				
1	St. Anne .....	0	P. Gauthier .....	50 00	Feb. 1, 1904	
2	Range 9 .....	3	Thos. Simard .....	50 00	Jan. 1, 1904	
3	St. Charles .....	3	J. Bouliane .....	50 00	" 1, 1904	
	Lac Clair .....	9	Albert Dufore .....	50 00		
		15		150 00		

NORTH SHORE (West of Bersimis.)

1	Murray Bay .....	0	Mrs. F. Vincent .....	50 00 or commission.	Previous to April 1, 1889.	Plus \$25 per year, and \$12 for battery care for operation of branch to Guay.
2	Cap-a-l'Aigle .....	4	Mde. Bergeron .....	50 00	June 1, 1905	
3	St. Fidele .....	6	Jos. Desbions .....	50 00	Dec. 1, 1904	
4	Port au Pencil .....	7	A. Brassard .....	50 00	May 1, 1889.	
			A. Brassard (repairer.)	210 00	June 1, 1897.	

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5	St. Siméon.....	D. Gaudin .....	50 00	Dec. 1, 1887
6	Baie des Rochers.....	G. Savard .....	50 00	June — 1887
7	St. Catharines Bay } Br. L.	(G. Boulienne .....	100 00	Nov. — 1886
8	St. Etienne.....	(E. Boulienne (rep'r.) .....	210 00	Sept. 1, 1889
9	Tadoussac (1½ knot cable).....	J. E. Caron .....	50 00	Nov. 1, 1888
10	Sacré Cœur.....	L. Maltais .....	50 00	Dec. 6, 1901
11	Br. from Tadoussac.....	Mad. E. Gauthier.....	50 00	Aug. 1, 1901
12	Bergeron.....	M. Savard .....	50 00	April — 1885
13	Escommins.....	J. H. Topping .....	50 00	May 6, 1892
14	Baie des Bacons.....	P. Bouchard .....	50 00 or commission	April 1, 1883
15	Mille Vaches.....	J. A. Faise .....	50 00 or commission	Sept. 1, 1903
16	Anse Hamilton.....	C. P. Easton .....	420 00	July 1, 1890
17	Portneuf, light.....	(S. Bouchard (rep'r.) .....	50 00 or commission	April 1, 1888
18	Sault au Cochon.....	(E. Courbois .....	50 00 or commission	Jan. 1, 1902
19	Bersimis.....	M. de A. Lausier, agt & op. assl. opr.	180 00	April — 1885
		E. Pope, distr. supt.	600 00	
			2,920 00	
		* Totals.....	174	

Commission at 25 per cent, without guarantee at Baie des Bacons, Accommodation office.

Sault au Cochon closed September 30, 1896.

\* NOTE.—In the estimates the maintenance of the Chicoutim and North Shore line is provided under head of North Shore Line. They are operated conjointly.

1	P'te aux Outardes (cable).....	H. Tremblay .....	50 00 or commission	Dec. 1, 1896
2	P'te Paradis (Manicouagan) cable landing.....			
3	Songals Mills 14 mile loop line from P'te Paradis.....	Accommodation.....	25 p. c. commission	Aug. — 1901
4	River Godbout (cable).....	N. A. Comeau .....	50 00 or commission	Oct. 15, 1885
5	Pointe des Monts.....	L. P. Faffard .....	50 00	Dec. 28, 1883
6	Trinity Bay West.....	Z. Poulin .....	50 00	May 16, 1884
7	Trinity Bay East.....	A. Bilodeau .....	25 p. c. or commission	" 1, 1889
8	Caribou Islands.....	I. Comeau .....	"	Sept. 1, 1889
9	Pointe aux Anglais.....	Paul Gâté .....	Accommodation office.....	Jan. 10, 1895
10	Pattecoast.....	(E. H. Tém, D. Supé, Mrs. E. H. Tém, as opr.	1,080 00 per annum	Nov. 1, 1891
11	Sto. Marguerite.....	A. Theriault .....	300 00	" 1, 1903
12	Clark City.....	(L. N. Caron .....	180 00	July 1, 1888
13	Seven Sands.....	Accommodation office.....	25 p. c. commission	April 17, 1903
14	River Montie.....	(P. E. Vignault, opr.	180 00 per annum	Jan. 29, 1884
15	Pigeon.....	(L. N. Caron .....	540 00	May 29, 1902
16	Little River.....	J. Poirier.....	50 00 or commission	June 1, 1896
17	Sheldrake.....	(Mrs. Peter Wright, opr.	50 00 or commission	Oct. 1, 1902
18	Thunder River.....	(Peter Wright, repr.....	112 00	" 1, 1902
19	Magpie.....	Miss H. Leberge .....	50 00	" 10, 1900
20	St. John River.....	Mrs. H. Gody .....	50 00	Dec. 1, 1904
21		Mrs. Alphonsse Girard.....	50 00	Feb. 1, 1890
22		Geo. Malloy .....	50 00	Oct. 1, 1889
23		B. Chambers.....	50 00	" 1, 1889

The repeating office formerly at Manicouagan was moved to Bersimis in September, 1896.

No commission is paid at this office.

Plus 50 cents per day when absent on duty. There is also an accommodation office in operation at Montie in the fishing season.

GOVERNMENT TELEGRAPH SERVICE—Continued.  
CHICOUTIMI AND NORTH ST. LAWRENCE TELEGRAPH SYSTEM—Continued, NORTH SHORE (East of Bersimis).

Number.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		¢ cts.		
20	Long Point.	10	A. Maloney.	500 00 per annum.	Sept. 21, 1896.	Long Point is the repeating office for the Anticosti, cable in operation since September 1, 1891.
21	Mingau.	7	Mrs. A. Maloney, as op.	180 00 "	Nov. 1, 1900.	
22	Point Esquimaux.	24	M. J. Maloney.	50 00 or commission	Oct. 1, 1889.	
23	Bethounanes.	20	Mrs. D. C. Hould.	240 00 per annum.	Sept. 1, 1897.	
24	Piastre Bay.	23	Edwd. Cyr, inspr.	500 00 "	Nov. 2, 1902.	Allowance for office rent \$4 per month.
			Jos. Picard, op. & rep.	212 00 "	July 15, 1904.	Plus 50 cents per day when absent on duty.
			S. Tanguay, repr.	112 00 "	Sept. 18, 1902.	
			Mrs. J. Boetz, opr.	100 00 "	" 18, 1902.	
25	Watchton.	15	Mrs. Cl. Bourque, opr.	100 00 "	Dec. 1, 1903.	This office was closed on withdrawal of former agent from Sept. 4, 1903. \$12 rent to J. Boetz.
26	Agnanus.	21 <sup>3</sup> / <sub>4</sub>	J. John Bourque, repr.	100 00 "	" 1, 1903.	
27	Natasloquan.	21	Mrs. Galant, repr.	112 00 "	Sept. 3, 1902.	
			Mrs. Galant, opr.	100 00 "	" 3, 1902.	
			Mrs. Vignault, repr.	112 00 "	" 5, 1902.	
			Geo. Anderson, opr.	112 00 "	" 16, 1902.	
			Miss Anderson, opr.	100 00 "	" 16, 1902.	
28	Kegaska.	33	J. W. Osborne, inspr.	500 00 "	" 16, 1902.	
29	Masquaro.	18	Wm. Foreman, opr. & rep.	212 00 "	June 1, 1903.	Plus 50 cents per day when absent on duty.
30	Ronahie.	25	M. Blais, repr.	112 00 "	Sept. 17, 1902.	
31	Wolf Bay.	24	Miss R. Blais, opr.	100 00 "	" 17, 1902.	
			R. Jones, repr.	150 00 "	Nov. 26, 1902.	
			Mrs. R. Jones, opr.	100 00 "	" 26, 1902.	
32	Pointe au Maurier.	24	J. Gallois, repr.	112 00 "	Sept. 13, 1902.	
33	Harrington.	20	Miss P. Gallois, opr.	100 00 "	" 13, 1902.	
			J. Jones, repr.	112 00 "	" 20, 1902.	
34	Whale Head.	17	Mrs. Jones, opr.	100 00 "	" 20, 1902.	
35	Mutton Bay.	20	Nap. Nadeau, rep. & opr.	212 00 "	Jan. 21, 1903.	
36	Baie de Ha.	27	Alf. Cormier, rep. & opr.	444 00 "	June 1, 1902.	
			Mrs. J. Monger, opr.	100 00 "	" 14, 1904.	
37	St. Augustine.	27	J. Monger, rep.	112 00 "	" 14, 1904.	
38	Coxip.	24	G. W. Burgess, rep. & opr.	212 00 "	Sept. 25, 1902.	
39	Rocky Bay.	30	Miss B. R. Chevalier, o.	212 00 "	" 25, 1902.	Closed June 14, 1904.
			L. O. Chevalier, rep.	100 00 "	April 30, 1904.	
			G. Chevalier, repr.	112 00 "	" 30, 1904.	
40	St. Paul River.	21	Miss Chevalier, repr.	112 00 "	Oct. 2, 1902.	
			Johnny Jones, opr.	100 00 "	" 2, 1902.	
41	Brador Bay.	29	P. C. Vignault, inspr.	500 00 "	June 13, 1903.	Plus 50 cents when absent on duty.
					Feb. 1, 1903.	

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42	Blanc Sablon.....	6	Thos. Morel, repr & opr.	212 00	"	Oct. 1, 1902
43	Fortean Bay.....	13	A. Hart, repr. & opr.	212 00	"	July 19, 1902
44	Pointe Auour.....	17	Thos. Whyatt, repr & opr	112 00	"	July 17, 1903
45	Western Modiste.....	16	Jas. Bolger, repr & opr.	212 00	"	Feb. 5, 1902
46	Red Bay.....	13	(Geo. Moore, repr	112 00	"	Oct. 9, 1902
			Miss Moore opr.	100 00	"	" 9, 1902
			(J. Mahoney, opr & insp	500 00	"	Sept. 1, 1902
47	Chateau Bay.....	30	Miss Buckle, last opr.	180 00	"	Dec. 1, 1902
			(J. McCarthy local rpr	100 00	"	Nov. 1, 1903
48	Belle Isle.....	23½	J. C. Colton, opr.....	360 00	"	Sept. 14, 1901
			Gen. inspector, North Shore System—			
			M. W. Crean.....	1,500 00		
	Totals.....	916		13,176 00		

## ONTARIO—PELEE ISLAND TELEGRAPH SERVICE.

1	Leamington.....	1	J. McE. Selkirk, D. Supr.	50 00	Nov. 1, 1888
2	Bairds.....	1	Accommodation office.		" 2, 1904
3	Leamington Dock.....	1	F. Deslauciers, accom-		" 1, 1895
4	Tildens.....	5	modation office.....	Commission 25 p.c	April 1, 1905
5	Point Pelee.....	5	W. A. Grubb.....		Nov. 1, 1888
	Leamington Dock to North Point Cable.....	17			
6	North Point Lighthouse.....	1	J. R. Ledwell.....	Commission 25 p.c.	June 1, 1899
7	North Dock.....	2	C. B. Quick.....	"	Nov. 1, 1888
8	McLure's Corner.....	2½	A. M. McCormick.....	"	" 9, 1888
9	West Dock.....	2½	Mrs. F. B. McCormick	"	Nov. 1, 1904
10	South Dock.....	5½		"	Aug. 1, 1904
	Totals.....	42½		50 00	

This is the connection that was formerly made with the club house near by.

The cable formerly 9½ knots from Point Pelee to the Island is now laid as here indicated 17 knots. The change was effected in August, 1901.  
Closed in August, 1904.

NOTE: This line is operated by telephones.



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GOVERNMENT TELEGRAPH SERVICE—Continued.  
LINES IN THE NORTH-WEST TERRITORIES.

No.	Stations.	Inter- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Qu'Appelle-Edmonton Sec.</i>	Miles.		% cts.		
1	Qu'Appelle.....	0	(J. S. MacDonald, Gen. Insp. R. C. MacDonald, Dist. Supd. C. P. R. Tel. Co.)	2,000 00 1,300 00 420 00	June 1, 1905. Oct. 1, 1905. Dec. 1, 1896.	
2	Fort Qu'Appelle.....	17	(J. W. Wilson, lineman... Miss E. Johnston.....)	500 00 600 00	Mar. 1, 1902. " 1, 1885.	
3	Touchwood.....	46	A. Von Landeberg.....	720 00	Nov. 1, 1883.	
4	Humbolt.....	78	H. J. MacDonald.....	720 00	Sept. 1, 1904.	Salary increased from \$600, since Nov. 1, 1903.
5	Saskatoon (14 miles loop)...	69	(C. P. R. Tel. Co.)	300 00	Jan. 1, 1892.	The agent-operator at Saskatoon is joint with the C. P. R.
6	Honrietta.....	52	(T. G. Clement..... W. Salisbury.....)	600 00 720 00	Oct. 1, 1903. April 15, 1900.	
7	Battleford.....	47	(J. D. Noel..... T. J. Callahan.....)	720 00 720 00	Oct. 1, 1900. Dec. 1, 1904.	Transferred from Bessaylor, Sept. 1, 1904.
8	Bessaylor.....	27	(Geo. Donovan, lineman... E. McCleughan.....)	600 00 600 00	Mar. 8, 1905. April 18, 1904.	" Battleford Closed since October, 1898. Office temporarily opened May 1, till Aug. 6, 1904, for Immigration Department.
9	Lloydminster loop (2 wires)	22	(E. McCleughan..... G. G. Mann.....)	720 00 720 00	Oct. 1, 1900. Aug. 1, 1902.	Salary increased from \$600, since Nov. 1, 1903.
10	Onion Lake.....	13	(G. G. Mann..... M. Thérien.....)	720 00 600 00	Oct. 1, 1902. Dec. 1, 1899.	" " " \$360
11	Moose.....	32	(J. W. Carroll..... J. A. K. Morrison.....)	600 00 600 00	Sept. 1, 1900. June 7, 1904.	A telephone line extends from the office at Saddle Lake to the Hudson School, 6½ miles. It is made from \$600 since Nov. 1, 1903.
12	Saddle Lake.....	13	(J. W. Carroll..... J. A. K. Morrison.....)	600 00 600 00	Sept. 1, 1900. June 7, 1904.	The loop line to Andrew runs from Victoria.
13	Andrew Loop (2 wires).....	4½	(J. A. K. Morrison..... R. Gordon.....)	600 00 600 00	Mar. 7, 1905. Feb. 1, 1905.	
14	Victoria.....	37	(R. Gordon..... E. A. Holmes.....)	600 00 600 00	Mar. 7, 1905. Feb. 1, 1905.	
15	Star.....	16	(E. A. Holmes..... A. W. M. Campbell.....)	600 00 720 00	Oct. 2, 1904. Oct. 1, 1898.	
16	Fort Saskatchewan.....	43	(T. J. McNamara..... J. W. McKay, lineman...)	720 00 720 00	Oct. 1, 1901. May 1, 1886.	Salary increased from \$300 from Aug. 1, 1904. The office at Edmonton has been operated jointly with the C. P. R. Tel. Co. since Jan. 1, 1892.
17	Edmonton.....	24	(T. J. McNamara..... J. W. McKay, lineman...)	720 00 600 00	Oct. 1, 1901. May 1, 1886.	
18	Athabasca.....	98	Jas. McKernan.....	600 00	Oct. 1, 1904.	
19	<i>Telephone Extension.</i>	723		18,520 00		
20	Whitford.....	7	The Postmaster.....	Conn. 25 p.c.	July 1, 1905.	Connection is made with the telegraph office at Andrew.

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Branch Lines.										
Edmonton.....	0	} In operation prior to 1905 } This section built in 1903.							This branch line operated by the Edmonton District Telephone Co.	
1 St. Albert.....	9									
2 River Qui Barre.....	21									
3 Alexandria.....	6									
	36									
Edmonton.....	0	}							This branch is operated as a telephone line. Construction completed October, 1904.	
1 Indian Agency.....	14									
2 Spruce Grove.....	5									
3 Stoney Plain.....	5									
	24									
Wood Mountain Section.									Moosejaw office is operated jointly with the Canadian Pacific Telegraph Co.	
1 Moosejaw.....	0						240 00	Dec. 1, 1891.		
2 Wood Mountain.....	90 $\frac{1}{2}$						600 00	" 1, 1893.		
3 Willow Bunch.....	38						600 00	" 1, 1890.		
	128 $\frac{1}{2}$						600 00	Oct. 19, 1904.		
							2,040 00			
Duck Lake Section.									Telephone connection.	
1 Batoche.....	0						120 00	" 1, 1902.		
2 Duck Lake.....	9						120 00	Feb. 1, 1903.		
3 Indian Agency.....	3 $\frac{3}{4}$									
	12 $\frac{1}{2}$						240 00			

GOVERNMENT TELEGRAPH SERVICE—Continued.  
LINES IN BRITISH COLUMBIA.

No.	Stations.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Kamloops—Lower Nicola.</i>	Miles.	(See note in margin).		\$ cts.		
1	Kamloops.	0	C. S. Stevens.	Agt. opr.	300 00	June 1, 1904.	NOTE.—This line is operated under the supervision of the resident engineer at Victoria, and for conversations 25c. for 5 minutes, half that rate for each additional 5 minutes or fraction thereof.
2	Anderson Creek.	12	Prov. Govt. Office.	Lessee.	"	July 1901.	
3	Nicola Valley.	13	W. McLeod.	"	"	" 1901.	
4	Stnups Lake.	13	W. R. McDonald.	"	"	" 1901.	
5	Beaver Ranch.	20	Thos. Bullman.	"	"	" 1901.	NOTE.—The lessees pay a monthly rent for the connections, and are allowed 25 per cent commission on local tolls for messages and conversations of non-subscribers.
6	Quelchona.	9	J. W. Moor.	"	"	" 1901.	
7	Nicola Lake.	9	E. O'Rourke.	"	"	May 1900.	
8	Condit.	13	A. E. Howse.	"	"	July 1901.	
9	Lower Nicola.	24	Blair & Co.	"	"	May 1900.	Three additional connections in July, 1901 Add at Nicola Lake, July 1, or Government Office, Dr. Sutton, A. R. Carrington.
10	Aspen Grove.	24	G. Armstrong.	"	"	" 1900.	
11	Otter Valley.	24	"	"	"	" 1900.	
12	Princeton.	26	"	"	"	" 1900.	
13	Hedley.	25	New line.	"	"	" 1900.	See note in body of report.
14	Keremeos.	20		"	"	" 1900.	
15	Fairview.	12		"	"	" 1900.	
16	Penticton.	37		"	"	" 1900.	
	Total.	255					

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## GOVERNMENT TELEGRAPH SERVICE—Continued.

## BRITISH COLUMBIA—Continued.

No.	Stations.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appoint- ment.	Memo
	<i>Vernon-Kilowna Line.</i>	Miles			\$ cts.		
1	Vernon .....	0	{ Miss G. E. Seaton A. S. Muir	Agent and operator ; Telephone agent . . .	360 00 Commiss	Mar. 1, 1905	This line is operated both as a telephone and telegraph line. Joint agent with C. P. Telegraph. The commission is 25 per cent of the Government line tolls.
2	Kilowna .....	35	{ H. H. Miller & Co. A. L. Weeks . . .	Agents tel. and telegr. Lineman . . . . .	360 00 720 00	" 1, 1905 " 1, 1905 Aug. 1, 1905	
	Total .....	35			1,440 00		

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## GOVERNMENT TELEGRAPH SERVICE.—Continued.

## BRITISH COLUMBIA—Continued.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Victoria—Cape Beale.</i>	Miles.	(See note in margin).	\$ cts.	Nov. 1, 1891.	<p>Note.—The superintendence of this line has been in the hands of the resident engineer at Victoria since October, 1901, when the arrangement theretofore in operation with the C. P. Ry. Co. was terminated.</p> <p>Proportion of salary.</p>
1	Victoria.....	0	E. Houghton, oper.(C.P.Tel.)	200 00	Nov. 1, 1891.	
2	Sooke.....	18	E. Gordon, agt. and operator.	720 00	Dec. 1, 1891.	
3	Otter Point.....	8	Percy Clark.....	540 00	" 1, 1903.	
3	Jordan River (Shirley).....	10	J. E. C. Williams.....	240 00	Sept. 22, 1903.	
4	Port San Juan (Port Renfrew)	30	J. W. Williams.....	520 00	May 1, 1905.	
			W. P. Daykin, repairer.....	240 00	Nov. 1, 1891.	
5	Carmahna Lighthouse.....	24	D. Logan, repairer.....	540 00	April 1, 1898.	
	(Close 2 miles west).....		R. S. Daykin, repairer.....	540 00	June 1, 1905.	
6	Cape Beale.....	28	M. Patterson, agt. & operator	120 00	Sept. 1, 1899.	
	Totals.....	118		3,660 00		

\*Telephone connections for the convenience of several firms in the neighbourhood have been established at *Jordan River* for Messrs. Bell, Irving & Co., *Point-no-Point*; The B. C. Packer's Assn., *Point-no-Point* and *Jordan River*; Capital City Canning Co., *French's Ranch*; J. H. Todd & Co., *Coal Creek*; 5 connections, rent paid \$12 each for a canning season. At *Otter Point* for Messrs. J. H. Todd & Son, The B. C. Packer's Assn., Capital City Canning Co. and the B. C. Mess.; one connection in common at *Sooke Wharf*, \$12 for the season.

## BRITISH COLUMBIA—Continued.

No.	Stations.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appoint- ment.	Mone.
	<i>Nanaimo-Comox.</i>	Miles.			\$ cts		
1	Nanaimo.....	0	(W. F. Archibald, A. M. Oliver, joint with C.P.R.)	Agent and operator..	306 00	Mar. 1, 1896	The amount comprises \$20 per month for agency and operation, \$3 for messenger service and \$2.60 for battery care.
2	Wellington.....	5	E. & N. Ry. Co.	Assistant operator...	120 00	June 1, 1902	
3	Parksville.....	23	(Mrs. R. Williams W. Mills)	Agent and operator " "	350 00 350 00	April 1, 1893 Dec. 1, 1897	
4	Union Bay.....	32½	(Miss E. McDon- ald)	Lineman .....	360 00	June 1, 1903	Parksville, Quilicum section.
5	Union Mines.....		(Thos. Hudson)	Agent and operator..	360 00	" 3, 1898	
			J. Dunsmuir	Lineman .....	780 00	Nov. 17, 1898	
				Accommodation office.	120 00		See mention of this in body of report (1897-98).
6	Cumberland.....	10	Albert Peacy	Agent and operator {	com. 25	Apr. 28, 1898	
7	Courtney.....	7		" " " " " "	p.c. ... }		
8	Comox.....	7¾	M. McDonald	Agent and operator..	300 00	Nov. 1, 1895	Courtney and Comox communicate by telephone at prearranged intervals.
	<i>Total.....</i>	81			2,766 00		
	<i>Parksville, Altermi and Cape Beale Line.</i>						
	Parksville.....	0	(See above)				
	Altermi.....	29½	Mrs. P. A. Haslam	Agent and operator..	240 00	Oct. 1, 1899	Proportion of salary for Comox line included.
1	Banfield Creek.....	53	Can. Pac. Tel.	" " " " " "	com. 50 p.c.	Dec. 1902	
2	Cape Beale.....	4	M. Patterson	Agent and operator..	240 00	May 1, 1900	Proportion of salary for this line.
	<i>Total.....</i>	86½			480 00		

Note.—The repairs of this line has been done jointly with the Can. Pac. Telegraph since December 1, 1902.

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## GOVERNMENT TELEGRAPH SERVICE—Continued.

## BRITISH COLUMBIA—Continued.

No.	Stations.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appoint- ment.	Memo.
	<i>Alberni-Clayoquot Line</i>				\$ cts.		
1	Alberni.....	0	P. A. Haslam.	Agent and operator.	120 00	Dec. 1, 1902	Proportion for this line.
2	New Alberni.....	2	E. A. Waterhouse.	Agent and operator.	Com. 25p. c	Oct. 1, 1903	Line crosses canal at this point by submarine cable.
	<i>Franklin Creek 4 mile cable.</i>	8					
3	Ucluelet <sup>st</sup> .....	10	E. B. Gerrard.	Agent lineman	650 00	" 1, 1902	Section extends from Franklin Creek to Pipestem Inlet, post offices address, New Alberni.
4	Ucluelet.....	10½	(W. L. Thompson	Agent lineman	720 00	Dec. 1, 1902	
			(H. J. Hillier	Lineman	660 00	" 1, 1902	
5	Clayoquot.....	66½	E. S. Reeve.	Agent lineman	720 00	" 1, 1902	
	Stubbs Island.			Accommodation office.			Private cable connection for local firm.
	Totals.....	96½			2,880 00		
	<i>Golden-Windermere Line.</i>						
1	Wilner.....	0	R. A. Power.	Agent and lineman.	780 00	Jan. 1, 1902	Operated from Windermere, Wilner and Spillimacheen.
2	Athalner.....	5	Telephone Comm'n			July 1, 1904	" Spillimacheen and Athalner.
3	Windermere.....	5	"	G. C. Pitts.	900 00	Jan. 1, 1902	Local superintendency.
4	Spillimacheen.....	16	(V. F. Dunn	Agent and lineman.			Operated from Windermere, Wilner and Athalner.
			(Telep. Comm'n				
5	Golden.....	66	W. A. Decow.	Agent and operator.	300 00	Dec. 1, 1904	Joint agent with C. P. Tel.
	Totals.....	92			1,980 00		

\* Telephone connection between this office and premises of the Nahmint Mining Company.



GOVERNMENT TELEGRAPH SERVICE—*Concluded.*BRITISH COLUMBIA—*Concluded.*

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
<i>Vancouver—Salt Springs Line.</i>						
1	Duncan Station.....	9	E. & N. Ry. Co.....	Accommodation, March 1, 1902.	March 1, 1902.	
2	Maple Bay.....	3	Wm. Beaumont.....	"	" 1, 1902.	
3	Sanson Narrows to Salt Springs (cable).....	6 $\frac{1}{2}$				
4	Edwards' Store.....	3	Edwards & Co.....	Accommodation, March 1, 1902.	March 1, 1902.	
5	Ganges Harbour.....	9		"	" 1, 1904.	
	Totals.....	24 $\frac{1}{2}$				

There have been no staff appointments on this line, it being worked by telephone for the present merely for general convenience, and looked after by the persons directly interested.

5-6 EDWARD VII., A. 1906

GOVERNMENT TELEGRAPH SERVICE.

## YUKON LINES.

NAMES of employees and monthly salaries, &c., Yukon Telegraph Service, which includes Port Simpson, Barkerville, Quesnelle and Lillooet branches.

Number.	Stations.	Inter'diate Distance.	Positions.	Salaries per Month.	Tariff.	Night Rate.
			C. E. Gooding, manager.....	8 cts. 60 00		
			H. B. Rochester, operator.....	42 00		
			C. Belleau, operator.....	42 00		
1	Ashcroft.....		M. A. Armstrong, operator.....	39 00		
			J. D. Fraser, lineman.....	75 00		
			R. P. Quain, clerk.....	83 00		
			J. T. Phelan, District Supt.....	175 00		
	Cache Creek.....	4	Accommodation office.....	50 p. c. com.	25 and 2	25 and 1
2	Bonapart.....	3½	" " " " " "	"	25 " 2	25 " 1
3	Pavillion.....	36½	Mrs. Bryson.....	"	25 " 2	25 " 1
4	Lilloet.....	22	S. A. McFarlane, agt & lineman..	60 00	25 " 2	25 " 1
5	Clinton.....	26	E. LeBourdais, opr. and lineman..	60 00	25 " 2	25 " 1
6	115 Mile House.....	55	D. M. LeBourdais " " " "	60 00	25 " 2	25 " 1
7	150 " " " " " "	35	S. T. Hall, operator and lineman..	60 00	50 " 3	30 " 2
8	Harpers Camp.....	33	S. H. Patenaud, " " " "	60 00	50 " 3	30 " 2
9	Bullion.....	27	" " " " " "	"	"	"
10	Quesnel Forks.....	4	O. Landry, operator and lineman..	66 66	50 " 3	30 " 2
11	Soda Creek.....	42	C. H. Smith, " " " "	60 00	50 " 3	30 " 2
12	Alexandria.....	28	G. A. Broughton " " " "	60 00	50 " 3	30 " 2
13	Quesnel.....	26	T. F. Murphy, " " " "	75 00	50 " 3	30 " 2
14	Lafontaine.....	46	Cariboo Consolidated Co.....	50 p. c. com.	50 " 3	"
15	Barkerville.....	15	J. Stone, operator and lineman..	60 00	50 " 3	"
16	Blackwater & Fraser Lake.....	53	J. N. Walker, operator.....	75 00	75 " 5	"
17	Bobtail Lake.....	45	J. W. Harrison, " " " "	75 00	75 " 5	"
18	Stoney Creek.....	35	W. J. Milne " " " "	75 00	75 " 5	"
			J. D. Charleson, lineman.....	70 00	"	"
19	Fraser Lake.....	35	G. W. Proctor, operator.....	75 00	75 " 5	"
			M. McNevin, lineman.....	70 00	"	"
20	Burns Lake.....	69	W. Heinz, operator.....	75 00	75 " 5	"
21	South Bulkley.....	30	E. Barrett, lineman.....	70 00	75 " 5	"
22	North Bulkley.....	25	" " " " " "	"	"	"
23	Bulkley Ranch.....	27	H. N. Boss, operator.....	75 00	100 " 7	"
			H. Fink, lineman.....	70 00	"	"
24	Morricetown.....	35	" " " " " "	"	"	"
25	Hazleton.....	40	G. M. Swan, operator.....	100 00	125 " 10	"
			E. R. Cox " " " "	100 00	"	"
			E. E. Charleson, line foreman....	150 00	"	"
			J. C. K. Seeley, lineman.....	75 00	"	"
			F. Charleson " " " "	70 00	"	"
26	Meanskinitst §.....	35	E. Tomlinson, operator.....	50 00	125 " 10	"
			R. Tomlinson, lineman.....	75 00	"	"
27	Skeena Canyon §.....	47	J. W. Graham, operator.....	75 00	"	"
			C. Durham, lineman.....	70 00	"	"
28	Lorne Creek §.....	24	J. D. McIntosh, operator.....	75 00	"	"
29	Grave Yard Point §.....		W. S. Dobbie " " " "	75 00	"	"
			A. E. Johnston, lineman.....	70 00	"	"
30	Telegraph Point §.....	53	W. J. O'Neill, operator.....	75 00	150 " 10	"
			W. R. Flewin, lineman.....	70 00	"	"
31	Aberdeen §.....	4½	G. Couto, operator.....	75 00	"	"
			R. Donaldson, lineman.....	70 00	"	"
32	Port Simpson §.....	39	M. W. O'Neill, operator.....	50 00	"	"
33	1st Cabin.....	27	H. A. Cullon " " " "	75 00	"	"
			Hugh Taylor, lineman.....	70 00	"	"
34	2nd Cabin.....	28	G. T. Carpenter, operator.....	70 00	"	"
			W. Loisselle, lineman.....	70 00	"	"
35	3rd Cabin.....	25	W. J. Tonvie, operator.....	75 00	"	"
36	4th Cabin.....	20	P. Burnell " " " "	75 00	"	"
37	5th Cabin.....	20	E. A. Hawley " " " "	160 00	"	"
			C. Jepson, lineman.....	83 per day.	"	"
38	6th Cabin.....	20	G. T. Brown, operator.....	100 00	"	"
39	7th Cabin.....	19	T. E. Harkin " " " "	100 00	"	"
40	8th Cabin.....	19	Jas. Mooney " " " "	100 00	"	"
			L. Dubois, lineman.....	83 per day.	"	"

## SESSIONAL PAPER No. 19

GOVERNMENT TELEGRAPH SERVICE—*Continued.*NAMES of employees and monthly salaries, &c., Yukon Telegraph Service, &c.—*Con.*YUKON LINES—*Continued.*

Number.	Stations.	Intermediate Distance.	Positions.	Salaries per Month.	Tariff.	Night Rate.
				\$ cts.	\$ cts.	
41	9th Cabin.....	17	J. Muir, operator.....	100 00		
			G. Hill, lineman.....	83 per day.		
42	Echo Lake.....	32	F. N. Jackson, operator.....	100 00		
			J. Lowery, lineman.....	83 per day.		
43	25-Mile Cabin.....	25	J. H. Murie, operator.....	100 00		
			J. W. Hovey, lineman.....	83 per day.		
44	Iskoot.....	16	J. W. Watts, operator.....	100 00		
			W. Warnock, lineman.....	83 per day.		
45	Telegraph Creek.....	61	A. S. Gillespie, operator.....	100 00	175 " 10	
			W. S. Simpson, lineman.....	75 00		
			A. J. Charleson, line foreman.....	150 00		
46	Shesley.....	45	W. P. Ball, operator.....	82 50		
			Geo. E. Adsit, lineman.....	75 00		
47	Nahlin.....	61	S. G. Lawrence, operator.....	82 50		
			R. McKay, lineman.....	75 00	185 " 10	
48	Nakina.....	49	Geo. Coutts, operator.....	82 50		
			J. Huston, lineman.....	75 00		
49	Pike River.....	40	R. J. Barton, lineman & operator.....	82 50	200 " 15	
50	Atlin.....	23	F. W. Dowling, operator.....	116 66		
			A. B. Taylor.....	100 00		
			D. H. Gagné, line foreman.....	125 00		
51	Center Cabin.....	35				
52	Tagish.....	40	M. Grimes, operator.....	82 50		
			Adam Dickson, lineman.....	75 00	225 " 15	
			Gastin Aish.....	75 00		
53	Cariboo Crossing.....	18	S. E. Chambers, operator.....	82 50		
54	White Horse.....	65	A. B. Clegg, dist. supt.....	175 00		
			H. Gülchen, store-keeper.....	150 00		
			J. P. Champagne, clerk.....	112 50		
			G. S. Flemming.....	115 00	250 " 15	
			G. Henderson, lineman.....	75 00		
			Wm. Watson, messenger.....	25 00		
			T. Wakamoto, house kpr & cook.....	75 00		
55	Lower LeBerge.....	59	Douglas Potts, operator.....	82 50		
56	Hootalinqua.....	30	W. Peters, operator.....	82 50		
57	Big Salmon.....	34	H. O. Lokken, lineman.....	75 50		
			R. O. Freeman, operator.....	82 50		
58	Five Fingers.....	96				
59	Yukon Crossing.....	8	Aubry Tennant, operator.....	82 50		
			K. Smith, Lineman.....	75 00		
60	Fort Selkirk.....	50	Bruce Watson, operator.....	82 50	275 " 15	
61	Selwyn.....	30	R. P. Hall, operator.....	82 50		
			N. Wade, lineman.....	75 00		
62	Stewart River.....	75	Chas. N. Graham, operator.....	82 50	300 " 20	
63	Ogilvie.....	23	J. W. Wilkinson.....	82 50		
64	Dawson.....	48	W. Brownlow, manager.....	150 00		
			G. A. McLachlin, operator.....	125 00		
			F. A. Hanley, operator.....	125 00		
			R. C. McDonald, clerk.....	100 00		
			H. Douglas, jr., messenger.....	83 per day.		
			Mrs. D. Hunt, house kpr & cook.....	100 00		
			Jas. McMenamin, lineman.....	80 00		
			C. A. Couture, line foreman.....	125 00		
65	Forty Mile.....	55	W. H. Mullin, operator.....	82 50	325 " 20	
66	Boundary.....	40				
	Vancouver.....		J. Y. Rochester, act. supt.....	200 00		
			J. E. Gobeil, genl. inspr.....	166 66		
			J. J. Healy, clerk.....	140 00		
			Emma Hays, stenographer.....	65 00		
		2,252½				
			Add 10 persons 83 per day as above.....	867 00		
			Total monthly salaries say.....	9,707 98		

\* Branch from Ashcroft.

† 150 Mile House.

‡ Quesnel.

§ Hazelton.

## YUKON TARIFFS.

The rates given above for points north of Quesnel are one-third less than those primarily adopted, which were calculated on the general basis of 50 cents for 100 miles and 25 cents for each additional 100 miles, counting the distance from Ashcroft.

The local rates between offices north of Quesnel are calculated on the basis of 50 cents for 100 miles and 25 cents for each additional 100 miles, and the local rates between offices north of Atlin are fixed at 50 cents for each 100 miles.

*Cable Messages.*—On transatlantic business the word rate is twice as much as the additional word rate given in the list for all points north of Ashcroft: Barkerville,  $3 \times 2 = 6c.$ ; Dawson  $20 \times 2 = 40c.$  per word.

On transpacific business the word rate is the additional word rate plus 4c.; Barkerville,  $3 + 4 = 7c.$ ; Dawson,  $20 + 4 = 24c.$  per word to or from Ashcroft.

*Press despatches.*—For the Yukon line the rate is 1 cent per word, minimum charge \$1; this applies to the whole line.

Yukon system connects at Boundary with U.S. Sig. Service Telegraph System.

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\* Where the tariff rate is entered as 25-1 cents or 50-2, &c., the meaning is that the rate is 25 cents or 50 cents for ten words and 1 cent or 2 cents for each additional word.

## GOVERNMENT TELEGRAPH LINES.

## SPECIAL TARIFF.

Cable messages.—Rates for cable messages passing over the Yukon line will be found in connection with the Yukon tariff in the preceding pages.

Elsewhere, the rate for transatlantic messages passing over the government lines is the same as for ordinary through messages, excepting where the ordinary tariff is more than 25 cents ; in such cases the government line rate is 4 cents per word, with a minimum charge of 25 cents. For example :—

For a message of six words or less the charge is 25 cents for government line.

For a message of seven words the charge is (7 x 4) 28 cent for government line.

For a message of twelve words the charge is (12 x 4) 48 cents for government line.

In every case the counting of words includes the address and signature in the same way as for transatlantic cable tolls.

Press despatches.—The rate for press despatches on the government lines (excepting the Yukon line), is 20 cents per 100 words; no single message less than 20 cents.

For the Yukon line the rate is 1 cent per word, minimum charge \$1 ; this applies to the whole line. Exception, Barkerville—Ashcroft section (local) minimum charge 50 cents.

## REGULAR TARIFF.

## NOVA SCOTIA.

*Line from North Sydney to Meat Cove and Mabou—Local rate, 25-1\* (20 offices).*

Big Bras d'Or. . . . .	Through	rate 15-1	from North Sydney, W. U. office.
New Campbellton's (Kelly's Cove) . . . . .	"	"	"
Englishtown. . . . .	"	"	"
Baddeck. . . . .	"	"	"
Murray. . . . .	"	"	"
Indian Brook. . . . .	"	"	"
French River. . . . .	"	"	"
South Ingonish. . . . .	"	"	"
Ingonish. . . . .	"	"	"
Neil's Harbour. . . . .	"	"	"
Dingwall. . . . .	"	"	"
Aspy Bay. . . . .	"	"	"
Meat Cove. . . . .	"	"	"
Pleasant Bay. . . . .	"	"	"
Cheticamp. . . . .	"	"	"
Grand Etang. . . . .	"	"	"
North-East Margaree. . . . .	"	"	"
Margaree Harbour. . . . .	"	"	"
South-West Margaree. . . . .	"	"	"
Inverness Town (Broad Cove)	"	"	"

\* When the tariff rate is entered as 25-1 or 50-2, &c., the meaning is that the rate is 25 cents or 50 cents for ten words and 1 cent or 2 cents for each additional word.

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Night messages are exchanged with the Western Union Telegraph Company for offices on this line. Rate 1 cent per word with minimum of 15 cents. The local night rate is 1 cent per word with minimum of 25 cents.

*Line from Barrington to Cape Sable—Local rate, 12-1.*

Newellton.. . . .	Through	rate 12-1	from Barrington, W. U. office.
Cape Sable Lighthouse.. . .	"	"	"

This line is now operated by the local telephone company. Terms of lease provide for former telegraph rate as above not being exceeded.

NEW BRUNSWICK.

*Line from Chatham to Point Escuminac—Local rate 25-1 (4 offices.)*

Bay du Vin.. . . .	Through	rate 15-1	from Chatham, G. N. W. office.
Lower Hardwicke.. . . .	"	"	"
Escuminac.. . . .	"	"	"
Pt. Escuminac Lt. House..	"	"	"

*Line from Eastport, Me., to Campobello, Grand Manan, and Whitehead Islands (9 offices)—Local rates between offices on Grand Manan, and Whitehead Islands, 15-1; Grand Manan and Campobello Island 25-2; The Islands and Eastport, Me., 25-2, W.U.O.*

Welchpool, Compobello.. . .	Through	rate 25-2	from Eastport, Me., W. U. office.
Flagg's Cove, Grand Manan..	"	"	"
Castalia.. . . .	"	"	"
Woodward's Cove.. . . .	"	"	"
Grand Harbour.. . . .	"	"	"
Seal Cove.. . . .	"	"	"
Southern Head.. . . .	"	"	"
Cheney's Head.. . . .	"	"	"
Whitehead Islands.. . . .	"	"	"

QUEBEC.

*Line from Gaspé to Anticosti Island, Q. (9 offices)—Local rates between offices on the Island 25-1; Gaspé and the Island offices 50-2.*

South-West Point.. . . .	Through	rate 50-2	from Gaspé, G. N. W. office.
Salt Lake.. . . .	"	"	"
Shallop Creek.. . . .	"	"	"
South Point.. . . .	"	"	"
Heath Point.. . . .	"	"	"
Fox Bay.. . . .	"	"	"
Becsie River.. . . .	"	"	"
West Point.. . . .	"	"	"
English Bay.. . . .	"	"	"

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*Line from Meat Cove, C.B., N.S., to Magdalen Islands, Q. (9 offices)—Local rates between offices on the Islands 25-1; Meat Cove and the Islands 50-2; offices on the Meat Cove line and the Islands 50-2.*

Amherst Island. . . . .	Through rate 50-2 from North Sydney, W. U. office.		
Amherst Lt. House. . . . .	"	"	"
Etang du Nord Village. . .	"	"	"
Etang du Nord Lt. House..	"	"	"
Cap aux Meules (Grindstone).	"	"	"
House Harbour. . . . .	"	"	"
Grosse Isle. . . . .	"	"	"
Grand Entry. . . . .	"	"	"
South Beach. . . . .	"	"	"
Bryon Island. . . . .	"	"	"

*Line from Meat Cove, C.B., N.S., to St. Paul's Island—Local rate between offices on Meat Cove line and St. Paul's 50-2 (1 office).*

St. Paul's Island Lt. House 50-2 from North Sydney, N.S., W.U. office.

*Line from Quebec to Grosse Isle Quarantine Station (7 offices)—Local rates between offices on Orleans Island and Isle Réaux, 15-1; on Orleans Island, Isle Réaux and Quebec, 15-1; on Orleans Island and Grosse Isle, 25-1; on Isle Réaux and Grosse Isle, 15-1.*

St. Pierre, Orléans Island..	Through rate 15-1 from Quebec, G. N. W. Office.		
Ste. Pétronille . . . . .	"	"	"
St. Laurent. . . . .	"	"	"
St. Jean . . . . .	"	"	"
St. François . . . . .	"	"	"
Isle Réaux . . . . .	"	"	"
Grosse Isle. . . . .	" 25-1	"	"

*Line from Baie St. Paul to Chicoutimi (7 offices).*

For business with offices west of Baie St. Paul and terminating at Quebec, add 15 cents and 1 cent to the government line tariff.

For business with offices west of Baie St. Paul, beyond Quebec, add the full rate of the Great North-western Telegraph Company to the government line tariff.

*Line from Murray Bay to Chateau Bay (48 offices) with branch to Anticosti and extension to Belle Isle.*

For business with offices west of Murray Bay and terminating at Quebec, add 15 cents and 1 cent to the government line tariff.

For business with offices west of Murray Bay, beyond Quebec, add the full rate of the Great North-Western Telegraph Company to the government line tariff.

*Local rates between offices not more than 100 miles apart 15-1; more than 100 miles apart 25-1; on mainland and Anticosti 50-2; and on mainland and Belle Isle 50-2.*

St. Urbain. . . . .	15-1 from Baie St. Paul (Ch. Que.) G. N. W. Office.		
Lacruche. . . . .	"	"	"
St. Alexis . . . . .	"	"	"
L'Anse St. Jean. . . . .	"	"	"
St. Alphonse de Bagotville..	"	"	"
Chicoutimi . . . . .	"	"	"



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Cap à l'Aigle.. . . . .	15-1	from Murray Bay (Ck. Que)	G. N. W. office.
Ste. Fidèle.. . . . .	"	"	"
Port au Persil.. . . . .	"	"	"
St. Siméon.. . . . .	"	"	"
Baie des Rochers.. . . . .	"	"	"
Rivière aux Canards.. . . . .	"	"	"
St. Etienne.. . . . .	"	"	"
Tadoussac.. . . . .	"	"	"
Sacré Coeur.. . . . .	"	"	"
Bon Désir.. . . . .	"	"	"
Bergeronnes.. . . . .	"	"	"
Escoumains.. . . . .	"	"	"
Baie des Bacons.. . . . .	"	"	"
Mille Vaches.. . . . .	25-1	"	"
Portneuf Mills.. . . . .	"	"	"
Portneuf Light.. . . . .	"	"	"
Sault au Cochon.. . . . .	"	"	"
Betsiamis (Bersimis).. . . . .	"	"	"
Manicouagan (Pt. Outardes).. . . . .	25-1	"	"
Scougall's Mills.. . . . .	"	"	"
River Godbout.. . . . .	"	"	"
Pointe des Monts.. . . . .	"	"	"
Trinity Bay, West.. . . . .	"	"	"
Trinity Bay, East.. . . . .	"	"	"
Caribou Islands.. . . . .	"	"	"
English Point.. . . . .	"	"	"
Pentecost.. . . . .	"	"	"
Ste. Marguerite.. . . . .	"	"	"
Clark City.. . . . .	"	"	"
Seven Islands.. . . . .	"	"	"
River Moisie.. . . . .	"	"	"
Little River.. . . . .	"	"	"
Sheldrake.. . . . .	"	"	"
Thunder River.. . . . .	"	"	"
Magpie.. . . . .	"	"	"
St. John River.. . . . .	"	"	"
Long Point.. . . . .	"	"	"
Mingan.. . . . .	"	"	"
Point Esquimaux.. . . . .	"	"	"
Betchouanes.. . . . .	"	"	"
Piastre Bay.. . . . .	"	"	"
Watichou.. . . . .	"	"	"
Aguanus.. . . . .	"	"	"
Natashquan.. . . . .	"	"	"
Kegaska.. . . . .	"	"	"
Masquaro.. . . . .	"	"	"
Big Romaine.. . . . .	"	"	"
Wolfe Bay.. . . . .	"	"	"
Pointe du Maurier.. . . . .	"	"	"
Harrington.. . . . .	"	"	"
Whale Head.. . . . .	"	"	"
Baie des Moutons.. . . . .	"	"	"
Bay de Ha.. . . . .	"	"	"
St. Augustin.. . . . .	"	"	"
Coxipi.. . . . .	"	"	"

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Rockey Bay.....	15-1 from Murray Bay (Ck. Que.)	G. N. W. office.
St. Paul River.. . . . .	"	"
Brador Bay.. . . . .	"	"
Bonne Espérance (St. Paul's River).....	"	"
Forteau Bay.. . . . .	"	"
Pointe Amour.. . . . .	"	"
Red Bay.. . . . .	"	"
Chateau Bay.. . . . .	"	"
Belle Isle.. . . . .	50-2	"
Anticosti Id. via Long Point.	"	"

## ONTARIO.

*Line from Leamington to Pelee Island (Telephone Circuit)—Local rates between Leamington and Point Pelee 15-1 ; mainland and Island offices 25-1 ; offices on the Island 15-1 (8 offices).*

Gun Club House, mainland..	15-1 (thro' business) from Leamington.	G. N. W.
Point Pelee mainland . . . .	"	"
Leamington Dock.. . . . .	"	"
Bairds.. . . . .	"	"
North Pt. Lt. H'se, Pelee Id.	"	"
North Dock, Pelee Island..	"	"
McIntyre's Corners.. . . .	"	"
West Dock, Pelee Island....	"	"
South Dock.. . . . .	"	"

## NORTH-WEST TERRITORIES.

*Line from Qu'Appelle (C.P.R. Sta.) to Edmonton, Alberta—Local rates, 15-1, 25-2, 50-3, for distances 10 to 600 miles (13 offices).*

Fort Qu'Appelle.. . . . .	25-2 Qu'Appelle or Saskatoon.
Touchwood.. . . . .	"
Saskatoon.. . . . .	"
Saskatoon (Ts. office C.P.R. Tel.)..	"
Henrietta.. . . . .	"
Battleford.. . . . .	"
Bresaylor.. . . . .	25-2 Saskatoon; 50-3 Qu'Appelle or Edmonton.
Onion Lake.. . . . .	"
Moose.. . . . .	"
St. Paul de Métis.. . . . .	50-3 Saskatoon, Qu'Appelle or Edmonton.
Saddle Lake.. . . . .	"
Victoria.. . . . .	25-2 Edmonton ; 50-3 Qu'Appelle or Saskatoon.
Star.. . . . .	"
Fort Saskatchewan....	"
Edmonton (Transfer office C.P.R. Tel.).. . . . .	"

*Line from Moosejaw (C. P. Stn.) to Wood Mountain—Local rates, 25-2 (1 office).*

Wood Mountain.. . . . .	25-2 from Moosejaw.
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## BRITISH COLUMBIA.

*Line from Victoria to Cape Beale—Local rate, 50-3 (6 offices).*

Sooke.. . . .	50-3 from	Victoria C. P. R. Tel. office.
Otter Point.. . . .	"	"
Jordan River.. . . .	"	"
Port San Juan.. . . .	"	"
Carmanah Lt. House.. . . .	"	"
Cape Beale.. . . .	"	"

*Line from Nanaimo to Comox—Local rate, 25-2 (9 offices).*

Wellington, (C.P.R. & E. & N. Ry.).. . . .	25-2 from	Nanaimo.
Parksville.. . . .	"	or Wellington.
Fanny Bay.. . . .	"	"
Cumberland.. . . .	"	"
Union Bay.. . . .	"	"
Union Mines.. . . .	"	"
Courtney.. . . .	"	"
Comox.. . . .	"	"
Alberni (branch).. . . .	"	"

*Line from Alberni to Cape Beale—Local rate, 50-3.*

Between offices on the Victoria-Cape Beale line and the Nanaimo-Comox line, via Alberni, 50-3.

*Line from Golden to Wildermere—Local rate 25-2 (3 offices).*

1. Athalmer.. . . .	25-2 from	Golden (C. P. Ry.)
2. Wilmer.. . . .	"	
3. Windermere .. . . .	"	

*Line from Kamloops to Lower Nicola (Telephone) (16 offices).*

Connections are leased and lessees allowed commission on messages of non-subscribers. Tariff 25-2 local from Kamloops, and for conversations 25 cents for five minutes, half that rate for each additional five minutes or fraction thereof.

*Yukon System.*

Tariff rates for the Yukon lines are given in the Table of Staff, &c., in the foregoing pages.

## SUMMARY.

Offices on government lines, as listed.. . . .	312
Offices at transfer points with connecting lines .. . . .	16

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Total number embraced by the service .. . . . 327

SPECIAL REPORT

ON THE

SOUTH BRITISH COLUMBIA TELEGRAPH SYSTEMS

By J. E. GOBEIL, Inspector.



## SPECIAL REPORT ON THE SOUTH BRITISH COLUMBIA TELEGRAPH SYSTEMS.

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THE DEPARTMENT OF PUBLIC WORKS, CANADA,

OTTAWA, April 10, 1905.

D. H. KEELEY, Esq.,  
General Superintendent,  
Dominion Government Telegraphs,  
Ottawa.

SIR,—I have the honour to submit to you a report on the inspection you had instructed me to make of the Kamloops-Nicola-Penticton and Kelowna-Vernon telephone lines in which I have thought it advisable to embody, in full, statements regarding the line and suggestions concerning the necessary extensions to be made, also regarding the way in which it should be managed for the better accommodation of the people it is intended to serve.

I will at first give a description of the service as it is at present, as well as of the territory traversed by the line, some notes concerning the mode of construction, then the suggestions which I take the respectful liberty to make.

## DESCRIPTION OF THE LINE.

*Kamloops, B.C.—*

Telephone in C. S. Stevens' office.  
W. McLeod's, first telephone on line, 12 miles from Kamloops.  
W. McDonald, second telephone on line, 20 miles from Kamloops.  
Bulman's, third telephone on line, 24 miles from Kamloops.  
Moore's, fourth telephone on line, 38 miles from Kamloops.  
Kirby's, fifth telephone on line, 47 miles from Kamloops.

*Nicola, 55 miles from Kamloops.*

A. E. Howse, sixth telephone on line.  
Mr. Carrington, seventh telephone on line.  
Provincial Government Office, eighth telephone on line.

*Coutlee, 8 miles from Nicola.*

Blair & Co., ninth telephone on line.

*Lower Nicola, 12 miles from Nicola.*

Woodward's, tenth telephone on line.  
Armstrong's eleventh telephone on line.

The above shows the 'phones now in operation on the Kamloops-Nicola, Coutlee and Lower Nicola line.

From Kamloops the line crosses the foothills which are very sparsely wooded. The line is in very good condition, although it has been up for over six years, and with very slight repairs could be placed in first-class shape. The greater part of this line is strung on planted poles, very few tree-poles having been used.

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Kamloops, 251 miles from Vancouver is a divisional point on the Canadian Pacific railway, and is the principal town in the Thompson river valley, was first established years ago as a Hudson Bay post. Population, 1,154. The north fork of the Thompson river comes down from the mountains, 200 miles northward, and here joins the main river. The principal industry of the Kamloops district is grazing. This is the supply point for a large ranching and mineral region to the south, reached by stage lines, and for the mines being operated in the immediate vicinity of the town. The elevated lands lying to the southward and westward of Kamloops are mostly used for cattle ranges. Cattle and horses are raised in considerable numbers. As far as mining is concerned it is to a great extent still in the prospect stage. The only systematically developed mine in the vicinity of Kamloops is the 'Iron Mask Mine,' six miles to the southwest, which was bought some years ago by the British Columbia Exploring Syndicate of London. An extensive plant has been installed on this property; it is connected with Kamloops by a private telephone line. A fine wagon road, 55 miles in length, leads from Kamloops to Nicola.

As shown above, there are twelve phones on this line from Kamloops to Lower Nicola. If an exchange be established at Nicola, seven more people, who have made application for phones, could be accommodated, making a total of 19 phones on this line.

#### NICOLA VALLEY.

##### *Nicola to Princeton.*

Nicola is the starting point of the new line called the Nicola-Penticton line which was opened for business about February 1, 1905.

Munro's, 26 miles from Nicola, first phone.

Thynne's, 46 miles from Nicola, second phone.

DeBarro's, 55 miles from Nicola, third phone.

##### Granite Creek—

Mrs. James, 61 miles from Nicola, fourth phone.

##### Princeton—

A. E. Howse, 72 miles from Nicola, fifth phone.

From Nicola  $5\frac{1}{2}$  miles of the line were built by Mr. A. E. Howse, general merchant of Nicola. These  $5\frac{1}{2}$  miles are built over open country where there was no timber, but this stretch of the line is in very good shape. Beyond this point to six miles beyond Munro's, a distance of 31 miles, only 252 planted poles were used, which would cover a distance of about  $7\frac{3}{4}$  miles, the balance, 23 miles, only tying, stringing of wire and placing of sideblocks and insulators was done as the line was strung on trees all of the way. A Mr. Hunter, of Nicola, seems to have acted as a general foreman over the construction of this line from Nicola to Penticton; the work being done by day labour.

From a point about 10 miles south of Munro's to Thynne's, the work has been well done, good poles and neat tying.

From Thynne's to Granite Creek the line is in fairly good condition.

From Granite Creek to Princeton,  $11\frac{3}{4}$  miles, the construction is not so good.

From a point about six miles south from Munro's, only 64 poles were planted in a distance of 40 miles, making about two miles of planted poles, so that the line is strung on trees 38 miles of the distance to Princeton, or to recapitulate, on the construction from Nicola to Princeton, 316 poles, representing 10 miles of line were planted, and the  $5\frac{1}{2}$  miles built by Mr. A. E. Howse, all planted poles, makes a total of  $15\frac{1}{2}$  miles of planted poles on 72 miles of line to Princeton, the balance being strung on trees.



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Nicola, including Upper and Lower Nicola, is a fine pastoral country with extensive valleys of good land for general agriculture. Two wagon roads go out of Nicola to the Canadian Pacific railway, one via Spence's bridge and the other to Kamloops.

The Douglas Lake Cattle Company and the British Columbia Cattle Company have extensive ranges in this section, where a large number of beef cattle are produced for the coast markets. The road direct to the south leads over the high lands into the valley along which there are many good farms. There are 161 settlers at Nicola and vicinity. Stock raising is practically the only industry of the valley. Other products are used entirely for home consumption. The mining industry, owing to lack of transportation, is yet in an undeveloped stage. Owing to one great need of the district, railway communication, new settlers are coming in slowly. The population is scattered. Public schools are situated at Nicola and Lower Nicola. There are several mining camps in this section: Aspen Grove, Quilchena, Mill creek, Ten Mile and Stump lake. About Coutlee and in the neighbourhood of Nicola lake there are some seams of very good coal.

As shown above, there are five 'phones on this line from Munro's to Princeton, both included, but with an exchange seven more phones could be put on the line which at present is altogether impossible, and these 'phones are urgently desired by the people along the line. This would make a total of twelve 'phones on these 72 miles of line.

## SIMILKAMEEN VALLEY.

*Princeton to Penticton.*

In Similkameen valley is included White lake, Keremos, Princeton and Otter creek. A good wagon road leading to Osoyoos, the mines in the boundary country and to Penticton, is the only means of communication at the present time. Princeton is about 40 miles higher up the Similkameen river than Keremos at the junction of the Tulameen.

Like the Kamloops division and Nicola valley, grazing and the raising of cattle is the only industry.

Public schools are situated at Princeton, Fairview, Keremeos and Similkameen. South-east from Princeton, 25 miles down the Similkameen river is Camp Hedley, a gold and copper camp and the only camp in the Similkameen district where any continuous development work and real mining has been carried on for a number of years, the result of which has been the opening up of the Nickel Plate mine and the erecting of a 40 stamp mill. It is stated that this company, The Daily Reduction Company, have already expended \$2,000,000 at this place in opening up the mine and installing their plant. The cyanide plant is stated to be the largest in the province.

No description, however slight, of the Similkameen district would be fair without mentioning the coal about Princeton which covers an area of 30 square miles with seams of coal in sight varying from 2½ feet to 18 feet in thickness. There is a good wagon road all through this district to Penticton where connection is made with the Okanagan Branch of the C.P.R.

## Princeton to Penticton—

Stewart and McDonald, sawmill, 21 miles from Princeton, phone.

## Hedley—

John Love, 26 miles from Princeton, phone.

Bradshaw's, 5 miles from Hedley, phone.

## Keremeos—

Richter's, 20 miles from Hedley, phone.

Kirby's.

## Fairview—

McCuddy's, 38 miles from Hedley, phone.

John Love.

## Okanagan Falls—

W. J. Snodgrass, 54 miles from Hedley, phone.

## Penticton—

J. A. Schubert, 68 miles from Hedley, phone.

From Princeton to Hedley the distance is 26 miles and for 19 miles of this the line is strung on trees.

From Hedley to Keremeos, a distance of 20 miles, the line is in very good condition, poles are large, and the wire well strung. The line was down in a couple of places, but it was repaired.

*Keremeos.*—The line branches here, going up Keremeos creek in a northeasterly direction for a distance of seven miles, then follows the wagon road to Penticton. From Keremeos to Clark's half way house, 151 poles were used, making about five miles of poles. The distance from Keremeos to Penticton following the stage road is 30 miles.

*Keremeos to Fairview, 17½ miles.*—The poles are very good and larger than any on the other lines.

The line from Fairview to Okanagan Falls and from Okanagan Falls to Penticton is in very good shape, only a few sideblocks being ripped off the poles or trees, owing to heavy strain.

There are nine phones on the line from Princeton to Penticton, while seventeen additional are wanted, two at Princeton and 15 at Hedley.

## OKANAGAN LAKE.

1. *Penticton to Kelowna.*—This district includes Penticton, Trout Creek, Summerland, Peachland and the various ranches and settlements on the shore of Lake Okanagan, some ninety miles long, extending from Penticton on the south to beyond Vernon on the north.

Penticton is a small settlement at the south end of Lake Okanagan, and is the end of navigation for steamers plying on the lake. Trout Creek is six miles to the northward on the west side and Summerland some three miles farther. Peachland is about ten miles from Summerland, still on the edge of the lake. The settlers, apart from the settlements before mentioned, are somewhat scattered owing to the abrupt nature of the shores which do not permit of ranching everywhere. Communication is maintained by steamers which ply on the lake.

On the east side about half way up the lake is Okanagan Mission of which Kelowna is the chief place and shipping point.

There is no telephone nor telegraphic communication between Penticton and Kelowna.

2. *Kelowna to Vernon (34 miles) End of Government Lines in this District.*—Kelowna is situated in the heart of the Okanagan Valley thirty-four miles from Vernon by road. To a casual observer, it seems to be a most flourishing town. The climate of the Okanagan valley is perfect, the days are warm, but the nights are cool, they have very little snow and sleighing is a matter of opportunity rather than of custom. Public schools are established at Kelowna, Lambly, Okanagan Falls, Okanagan Mission and Peachland.

This line is operated both by telephone and telegraph, which seems to suit the inhabitants of both Kelowna and Vernon.

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At Vernon the Hinton Company of Vancouver and Victoria, are installing a local telephone service and Kelowna expects to soon have one, which will produce an increase of revenue to the government line.

At Kelowna the telephone and telegraph instruments are both in the agent's house and are operated by Mr. Millie.

In Vernon the telegraph and telephone are in the C. P. R. office where a joint operator attends to both the government and C.P.R. business. There is also a telephone office in a store belonging to a Mr. Muir, who receives a commission on business done over the government telephone line.

To place these lines in good condition an experienced lineman should be sent in with a couple of men and a complete outfit of tools, and ordered to go over the whole line from Kamloops to Penticton. With the line in good shape throughout, a service can be established that will be of utmost satisfaction to the inhabitants of the several districts and a credit to the government. While the people on the line from Vernon to Kelowna are well satisfied with the present dual service of telegraph and telephone, I may say that on the Kamloops-Penticton stretch nothing but a telephone will suit, and I respectfully recommend that the system now used be continued.

As to the management of the line, the same seemed to be in a state of chaos, a different rate seemed to apply to almost each telephone, no one seemed to know what the rates were. At the present time, with the help of Mr. Stevens, of Kamloops, the following tariff was placed in force and everybody is pleased and satisfied:—

Stores and hotels. . . . .	\$5 00 per month.
Stores and hotels where accounts are kept . . . .	4 00 “ “
Dwellings. . . . .	3 50 “ “

## Messages—

Distance up to 100 miles. . . . .	25c. and 2c.
“ 100 to 150 “ . . . . .	35 “ 3
“ 150 to 200 “ . . . . .	40 “ 3
“ 200 to 250 “ . . . . .	50 “ 4

## Conversations—

Distance up to 100 miles. . . . .	5c. per minute.
“ 100 to 150 “ . . . . .	10 “ “
“ 150 to 200 “ . . . . .	12 “ “
“ 200 to 250 “ . . . . .	15 “ “

Minimum charge for conversations and messages 25 cents. I would strongly recommend that the tariff be not changed.

There are now 26 'phones on the line from Kamloops to Penticton and with such a number on a straight line the resulting service cannot be satisfactory.

This exemplifies at once the necessity for the installation of exchanges at Nicola and Hedley, as with an overloaded line, which occurs with more than six or seven 'phones, good service cannot be obtained, owing to the confusion in the ringing, calls, &c.

The following is a list of the required improvements to give a satisfactory service over the government lines in the section of British Columbia just inspected.

1. The establishment of exchanges at Nicola and Hedley.
2. The closing of gap between Kelowna and Penticton.
3. Connecting Spence's Bridge on the C.P.R. with Nicola.
4. Extension from Fairview to Midway.
5. Completing construction from Keremeos to Clark's.

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1. *Exchanges at Nicola and Hedley.*

This is absolutely necessary to give satisfactory service as the line is now overloaded with telephones and to take the instruments away from the people would raise a storm of protest from the whole country. There is only one of two things to do, either take off 'phones from the line or install an exchange at Nicola. The same advice applies to Hedley.

Following is an estimate of the cost of exchanges at Nicola and Hedley:—

## NICOLA EXCHANGE.

*(Grounded Circuit).*

Cost of materials.. . . .	\$320 27
Freight charges, Montreal to Spence's Bridge.. . . .	70 48
Poles to be had in neighbourhood, 20, \$1.50 each.. . . .	30 00
Installation, men's wages and board.. . . .	189 00
Wagon freight, Spence's Bridge to Nicola.. . . .	60 00
Contingencies.. . . .	75 00
Total cost.. . . .	690 75

## HEDLEY EXCHANGE.

*(Metallic Circuit.)*

Cost of materials.. . . .	\$456 90
Freight charges, Montreal to Penticton, B.C.. . . .	135 67
Poles (to be had near Hedley), 30, at \$1.50 each.. . . .	45 00
Installation, men's wages and board.. . . .	189 00
Wagon freight, Penticton to Hedley.. . . .	125 00
Telephones, 15 at \$30.. . . .	450 00
Contingencies.. . . .	100 00
Total cost.. . . .	\$1,501 57

A metallic circuit is recommended for Hedley instead of a grounded one, such as at Nicola, owing to the electric light service in Hedley, which does not exist at Nicola.

2. *Closing of Gap between Kelowna and Penticton.*

Everybody along the line, and especially at Penticton and Kelowna, earnestly desires the closing of this gap and they give, as their main reason, the fact that all supplies and freight, for the section of the country from Vernon to Princeton and even farther north, comes in over the lake and the people of these localities have no means of communication over this break in the government telephone service. Further, owing to the existence of this gap the inhabitants of Trout Creek, Summerland, Peachland and Lambly are altogether isolated. This part of the country produces large quantities of fruit and one can easily see how handicapped people are owing to lack of knowledge of the state of the markets. It is not only the people living in the locality who are so affected by this break in the line, but everybody from Vernon to Tulameen.

The distance from Penticton to Kelowna is 45 miles. If it should be decided to close this gap, about two miles of cable would be required to cross the lake opposite Kelowna. The approaches are sandy and the bottom is reported to be the same. The closing of this gap would cost about \$5,500, not including cable.

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No change should be made in the working of the Kelowna-Vernon line, as the persons most interested owing to the nature of their business prefer to use the telegraph, and certainly would not use anything else for the transacting of their business.

If this gap be closed the same system should be adopted that now exists on the Kelowna-Vernon line, that is a dual telephone and telegraph service from Penticton to Kelowna.

### 3. *Connecting Nicola with Spence's Bridge.*

It has been represented that the first intention of the department was to build from Spence's Bridge to Nicola, but, subsequently, instructions were issued to build over the route the line now follows, that is, Kamloops to Nicola, and I understand that the merchants of Nicola very urgently desire and need the extension of this line from Nicola to Spence's Bridge, because all the freight coming into Nicola and going to Tulameen and even Granite Creek comes in over this road, consequently all the business and interests of the people of this locality lies in that direction.

The distance from Nicola to Spence's Bridge is 35 miles, and this extension could be built for \$3,500.

### 4. *Extension from Fairview to Midway.*

There is at present in the department a petition praying for this extension and I have seen a great number of people, while on this inspection, who repeatedly asked to have this petition brought to the notice of the proper authorities and begging that notice be taken of same. If the extension asked for was built it would give the inhabitants of the district, through which the government line now passes, connection via Midway with what is known in British Columbia as the Boundary Country, the Kootenays and with an outlet via Spokane. There is at present a telephone system in that section, and Midway is on the circuit. Different routes have, I believe, been advocated, but the most rational, effective, and shortest which would prove satisfactory to the majority would be:—

From Fairview to Osoyoos . . . . .	13 miles.
“ Osoyoos to Sidley's . . . . .	13 “
“ Sidley's to Gillespies . . . . .	4 “
“ Gillespies to Rock Creek . . . . .	12 “
“ Rock Creek to Midway . . . . .	12 “
Total . . . . .	54 “

This could be built for the sum of \$6,500.

### 5. *Completing from Keremeos to Clark's.*

Part of the poles on this spur are planted, trees blazed, and if insulators, side-blocks, and wire were placed on this section, the requirements of Hedley, Penticton and Keremeos would be satisfied.

Olalla is  $3\frac{1}{2}$  miles from Keremeos, with a population of 25. Phones are very much wanted at this place, and in my opinion the line should be completed as far as Clark's Half Way House, where a telephone is urgently needed and asked for. This would cost about \$300.

## RECAPITULATION OF COST OF REQUIRED IMPROVEMENTS.

1.	{ Exchange at Nicola . . . . .	\$ 690 75
	"      at Hedley . . . . .	1,501 57
2.	Closing Penticton-Kelowna gap . . . . .	5,500 00
3.	Nicola-Spence's Bridge extension . . . . .	3,500 00
4.	Fairview-Midway extension . . . . .	6,500 00
5.	Keremeos to Clark's . . . . .	300 00

Total . . . . . \$17,992 32

*Revenue.*

Present revenue from 'rentals' on Kamloops-Nicola-Coutee and Lower Nicola line . . . .	\$30 00 per month.
Increased revenue from 'rentals' on same line if exchange be installed at Nicola . . . . .	\$ 17 50 per month.
Present revenue from 'rentals' on Nicola-Penticton line with tariff now in force . . . . .	\$51 50 per month.
Assured increase in revenue from 'rentals' if exchange be installed at Hedley . . . . .	\$112 00 per month.
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	\$81 50 per month. \$129 50 per month.

*Note 1.*

The above revenue does not include receipts from conversations and messages which average . . . . . \$107 per month.

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\$188 50 per month.

Total monthly revenue . . . . . \$318 00 per month.

*Note 2.*

The Kelowna-Vernon line has not been long enough in operation to permit of a statement as to its revenue.

*Note 3.*

If exchanges are installed at Nicola and Hedley the increased revenue in 'rentals' alone is assured, while on the other hand, if exchanges are not put in, 'phones will have to be taken off the line and the meagre revenue of \$81.50 will be still smaller, hence the obvious necessity of putting in these exchanges.

## EXPENDITURE.

Owing to the present indefinite conditions prevailing over these lines, it is difficult to state exactly what would be the total expenditure of management in order to compare the same with assured revenue shown before, it may, however, be sufficient to say that matters can be so arranged that the revenue will certainly equal

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and most probably exceed the expenditure. Following is an approximate estimate of cost of maintenance:—

Superintendent at Kamloops, say . . . . .	\$ 75 00	per month.
Exchange operator at Hedley . . . . .	40 00	"
Exchange operator at Nicola . . . . .	40 00	"
Operator at Kelowna . . . . .	30 00	"
Operator at Vernon . . . . .	30 00	"
Repairs, monthly, say . . . . .	75 00	"
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Total expenditure . . . . .	\$290 00	"
" revenue . . . . .	318 00	"
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Balance . . . . .	\$ 28 00	"

In conclusion, I beg to recommend that the management of the telephone lines in the districts referred to should be placed in the hands of some one on the ground, one who is well acquainted with the district, the needs of the people living in the same, and the conditions of the country.

With reference to the above, I would wish to respectfully recommend that Mr. C. S. Stevens, of Kamloops, B.C., be placed in charge. From personal observation, and, taking into consideration public opinion throughout the district, this gentleman would be fully qualified to occupy the position as he understands line construction thoroughly, the management and installation of telephones and has a very good knowledge of office work such as is required for the making of reports, the checking of returns and other business connected with the proper management of a telephone line. If this suggestion be acted upon, I believe the department will have reason to congratulate itself upon the acquisition of the services of a very good man.

I have the honour to be, sir,

Your obedient servant,

(Sgd.) J. E. GOBEIL,

*Inspector.*





PART VI

REPORT OF THE COLLECTOR OF REVENUE

DEPARTMENT OF PUBLIC WORKS.

1904-1905.



## DEPARTMENT OF PUBLIC WORKS,

OTTAWA, November 18, 1905.

F. GÉLINAS, Esq.,

Secretary, Department of Public Works,  
Ottawa.

SIR,—I have the honour of submitting my report for the year ended June 30, 1905.

I have examined the books and accounts of the officers under my control (excepting those of the dock-master at Esquimalt) and it is my pleasant duty to state that, in all cases, the rules laid down by the department for their guidance have been carefully observed by these officers who have faithfully accounted for all revenues collected by them.

During the fiscal year just closed the revenue accrued from public works shows an increase of \$4,008.87, being \$111,959.77, while for the previous year it was \$107,950.90.

The collections also show an increase of \$4,815.95 being \$111,931.27, while in the preceding year they amounted to \$107,115.32.

The revenue accrued from slides and booms was \$82,873.97 or \$11,542.77 more than in 1903-04. The collections were \$82,873.97, or \$12,378.35 more than the previous year. The outstanding uncollected dues have decreased by \$2,328.32, an amount written off for cause given hereafter.

The graving docks yielded \$24,754.30, or \$7,690.26 less than in 1903-04.

No tolls were received from the Yamaska and Rivière du Lièvre locks.

From rents, the revenue was \$4,331.50, being \$297 more than previous year, of this however, \$28.50 was written off on account of poverty of tenants, leaving a net increase of \$268.50.

Having dealt with the revenue in a general way, I beg to submit the particulars in detail relative to the several services under their respective heads.

## SLIDES AND BOOMS.

## OTTAWA DISTRICT.

The tolls charged up amounted to \$44,652.03 ; \$2,895.18 more than in 1903-04.

The number of logs that passed through the works was 4,404,675, or 90,151 more than the previous year.

Of square timber there were 3,372 pieces, being 11,720 pieces less than in 1903-04.

All the revenue accrued in this district during the year just closed was collected.

Of the dues accrued since July 1, 1889, when this department took over the collection, there remains uncollected \$8,145.35, full particulars of which will be found in statement No. 2 herewith.

Of the dues accrued prior to July 1, 1889, there remains \$56,805.65, all of which should be written off.—See statements Nos. 1 and 3 herewith for particulars.

The accounts for the Ottawa district stand thus :—

Dues accrued during the year 1904-05. . . . . \$44,652 03  
All collected.

Amount outstanding is as follows :—

Dues accrued prior to the collection being transferred to this department. . . . .	56,805 65
Dues of 1889-90. . . . .	\$6,903 05
“ 1890-91. . . . .	28 42
“ 1892-93. . . . .	379 80
“ 1896-97. . . . .	196 71
“ 1903-04. . . . .	637 37
	8,145 35

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I would again ask particular attention to the fact that since the department assumed the collection of these dues, of the amount accrued viz., \$840,569.47, all but \$28.42 absolutely owing to the department has been collected. The remainder above shown as uncollected and aggregating \$8,116.93 being composed of Chaudiere boomage, \$6,903.05, which should have been written off long ago, and the balance being covered by counter claims, which if my information be correct with regard to them ought to be allowed, except perhaps the item of 1903-04.

It may be proper here to explain that the \$2,328.32 written off was a charge for Black river slidage in 1900. A portion of the works was carried away that year and it was proved to the satisfaction of the department that the logs upon which the charge was levied were so much damaged in consequence of the accident, that the loss on them amounted to very much more than the tolls charged against them.

The increases and decreases from the different works were as follows :

Increases.—Petewawa, \$4,568.32 ; Black river, \$501.58 ; Gatineau, \$264.54 and Madawaska, \$993.62.

Decreases.—Main Ottawa, \$2,184.01 ; Cheneaux Boom, \$421.10 ; Coulonge, \$684.86 and Dumoine, \$142.91.

Again the revenue falls short of the estimated income when the present tariff was imposed, but this can I think be largely attributed to the great number of small logs, formerly left in the woods, being now brought down and utilized. And I may say here that the constant decrease in diameter of the logs brought down accounts for the fact that though the number of pieces increase yet the revenue does not always show a corresponding increment.

Again as the small spruce is now being utilized and as the Doyle rule does not give anything appreciable for logs under 8 inches in diameter, and as all under that diameter is charged by the cord, the same being computed on the cubic contents of each piece : a large quantity of this timber appears in my statements as so many cords of pulp wood, hence the number of logs may appear to be less than it would seem it should be to those who see it passing particular points or are led by newspaper reports.

Herewith are statements in detail :

No. 1.—Statement of amounts outstanding prior to July 1, 1889, uncollected September, 30, 1905.

No. 2.—Statement of dues accrued at Ottawa since July 1, 1889, uncollected September 30, 1905.

No. 3.—Statement of amounts accrued at Quebec, prior to July 1, 1889, uncollected September 30, 1905.

No. 4.—Statement of the number of pieces of square timber, saw logs, &c., which passed through the Ottawa works during the year ended June 30, 1905.

No. 5.—Statement of dues accrued from each of the slides and works in the Ottawa district during the year ended June 30, 1905.

#### ST. MAURICE DISTRICT.

The revenue from this district was \$36,431.21, being \$9,109.54 more than the previous year, and the largest in the history of these works.

The number of pieces of timber of all kinds which passed through the works was equivalent to 3,540,383 logs.

All the dues of 1905 were collected.

Since I took charge of this district, in 1892, all the revenue has been collected.

The amount outstanding remains the same as at the close of the year ended June 30, 1904,—namely \$14,481.49,—all of which should be written off, for reasons assigned in Statement No. 6, herewith.

As in 1904, the spring was remarkable for paucity of rain, hence an unusual quantity of logs was left in the tributaries of the St. Maurice, yet owing to a fair

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supply of water in the main river, it may be said that all the logs that came out into the main stream reached their destination. I anticipated a large increase in the revenue for the current year (1905-06), but owing to the cause above mentioned, whereby nearly a million and a half of logs did not come out, I do not now expect that it will reach a very much larger figure than last year, if even as great.

Owing to favourable circumstances, the booms were all in position in ample time to prevent any logs going out into the St. Lawrence, hence there was little or no loss to the lumbermen on this account.

An alligator tug was placed at Three Rivers in time to assist in putting out the booms last spring, and has proved to be of very valuable assistance in many ways, besides yielding a small revenue while working for the lumbermen, at times when not required for public service; I hope to see this item much larger next year.

I beg again to urge the necessity for a system of water storage on the great lakes on the upper St. Maurice, the necessity for which is becoming more and more apparent as the years go by, and I am confident that if such a scheme were carried out, a sum sufficient to cover interest and working expenses, would be guaranteed by the large manufacturing interests on this river.

There has been, no doubt, a large outlay on these works during the past few years, but it is to be borne in mind that most of the expense was in renewing booms and works constructed half a century ago and something had to be done to protect the trade which has developed into such an important factor among the manufacturing interests of the country; and moreover there is every indication that the paper industry on the St. Maurice will in a very short time be more than twice as large as it is to-day, the opening up of the upper country by means of railways making the getting in of supplies so much cheaper and more convenient, will it is expected enable at least one large company, whose mills are to be in the vicinity of Three Rivers, to commence operations next year, and the tolls on the timber required to supply this industry will form a large item in the revenue from the St. Maurice works.

The construction of the dam at Grandes Piles will doubtless be a great aid in driving and securing the safety of the logs and with such a system of storing the water as already frequently suggested and the splendid system of works, would make the St. Maurice an ideal stream for handling the material necessary to supply the great paper industries existing and in contemplation.

Hence I look forward to the revenue being, very soon, not only sufficient to cover interest and working expenses but yielding, as time goes on a sum to be credited against the deficits of the last ten years.

## TRENT AND NEWCASTLE DISTRICT.

The dues accrued from this district amounted to \$1,790.73, all of which was collected.

The total outstanding on June 30, 1905, was \$8,323.81, of which \$3,521.19, should be written off in accordance with a judgment in the Exchequer Court; of the remainder, \$4,766.92 was paid in October 14, 1905, too late to be included in the accounts for the year just closed, leaving \$35.70, which will have to be written off, the debtor being hopelessly insolvent and a very old man.

Full particulars of amount outstanding will be found in statement No. 7 herewith.

## GRAVING DOCKS.

## ESQUIMALT GRAVING DOCK.

The revenue from this source was \$4,632.54, shown in detail, in statement No. 8 herewith, being \$5,248.81, less than previous year.

Of the 62 days the dock was used during the year, it was occupied by H. M. vessels for 51 days and the mercantile marine for 11 days.

The withdrawal of the fleet from Esquimalt will be severely felt in loss of revenue from this work.

## LÉVIS GRAVING DOCK.

The revenue from this work was \$850.53 more than for the previous year, being for 1904-05, \$16,454.38. See statement No. 9 herewith.

The dock was occupied for 130 days exclusive of winter months, during which it was held by ss. *Savoy* and *Lord Strathcona*, steamer *Canada* and government dredge No. 6 and tug *Monitor*.

## KINGSTON GRAVING DOCK.

This dock was occupied for only 48½ days exclusive of winter months. The income for the past year was \$3,667.38 or \$3,321.98 less than in 1903-04. See statement No. 10.

The steamer *Spartan* and government dredge *Nipissing* wintered in this dock.

## LOCKS.

As the order in council of July 28, 1903, abolishing the tolls for two years was revived last spring there is no revenue to report from these works.

## RENTS.

The collections on this account were as follows :—

From old P. O. building, Victoria, B.C. . . . .	\$3,792 00
“ Part Toronto Island . . . . .	1 00
“ Land in Kingston, Ont. . . . .	1 00
“ Part graving dock premises, Kingston, Ont. . .	250 00
“ Part reserve, Victoria Island, Ottawa, Ont. . .	2 00
“ Reserve, Cap de la Magdeleine, P.Q. . . . .	50 00
“ Cape Tormentine, N. B. buildings . . . . .	1 00
“ Cathedral street property, Montreal, P.Q. . . .	190 50
“ Navy Island, St. Andrew's, N.B. . . . .	9 00
“ Beach, Burlington channel . . . . .	1 00
“ Drill hall site, Sherbrooke, P.Q. . . . .	5 50
	<hr/>
	\$4,303 00

The sum of \$28.50 was written off, on account of the poverty of two of the tenants, of the Cathedral street property, Montreal



## SESSIONAL PAPER No. 19

The following comparative table of Public Works revenue accrued 1904-05 and 1903-04, shows at a glance in what accounts increases and decreases herein reported have occurred :—

	Year, 1904-5.	Year, 1903-4.	Increase, 1904-5.	Decrease, 1904-5.
SLIDES AND BOOMS.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Ottawa District . . . . .	44,652 03	41,756 85	2,895 18	
St. Maurice District . . . . .	36,431 21	27,321 67	9,109 54	
Newcastle District . . . . .	1,790 73	2,252 68		461 95
(Net increase, \$11,542.77) . . . . .	82,873 97	71,331 20	12,004 72	461 95
GRAVING DOCKS.				
Esquimalt, B.C. . . . .	4,632 54	9,881 35		5,248 81
Levis . . . . .	16,454 38	15,573 85	880 53	
Kingston . . . . .	3,667 38	6,989 36		3,321 98
(Net decrease, \$7,690.26) . . . . .	24,754 30	32,444 56	880 53	8,570 79
Rents . . . . .	4,331 50	4,034 50	297 00	

The total revenue that passed through my hands during the year ending June 30, 1905, was as follows :—

From Slides and booms . . . . .	\$ 82,873 97
“ Graving Docks, . . . . .	24,754 30
“ Rents . . . . .	4,303 00
	<u>\$111,931 27</u>

In conclusion I have to acknowledge the uniform courtesy and cheerful assistance accorded me at all times by the officers with whom I have been brought in contact during the year.

I have the honour to be,

Respectfully, sir,

Your very obedient servant,

EDWARD T. SMITH.

5-6 EDWARD VII., A. 1906

No. 1.—STATEMENT of Slidage and Boonage from the Ottawa Slides and Works, accrued prior to July 1, 1889, Outstanding June 30, 1905, and remaining uncollected on September 30, 1905.

By whom due.	Bad and Doubtful Debts.	Chaudière Boonage in Suspense.*	Other Slide and Boom Dues Disputed.	Total Outstanding on Sept. 30, 1902.	Year to which Dues Belong.	Remarks.
	\$ cts.	% cts.	% cts.	\$ cts.		
John & Wm. McLean.....	53 14			53 14	1873.	Insolvent.
John Rowan.....	342 50			342 50	1872-1873.	"
Leinieux & Charette.....	21 30			21 30	1873	"
Tailon & Lapierre.....	148 10			148 10	1873-1874.	"
Mosgrove & McHarry.....	261 42			261 42	1873-1874.	"
W. C. Wells.....	600 90			600 90	1873-1874.	"
Dufresne & McNulty.....	528 80			528 80	1874-1875.	"
Walton Smith.....	171 46			171 46	1874-1875.	"
A. H. Baldwin.....	3,507 92			3,507 92	1871 to 1874.	"
Hon. James Skead.....	9,807 65			9,807 65	1861, 1863, 1864, 1869, 1875 to 1878.	"
Batson & Currier.....	5,558 70			5,558 70	1875 to 1877.	"
A. F. A. Knight.....	546 30			546 30	1878.	"
James Walker.....	11 25			11 25	1877.	"
R. Campbell & Son.....	1,558 50			1,558 50	1879 to 1881.	"
James G. Bryson.....	73 50			73 50	1886	"
Costello Bros.....	90 62			90 62	1882	"
N. E. Cormier.....	428 34			428 34	1888	"
James Yull.....	9 23			9 23	1876.	Overcharge.
J. & B. Grier.....	76 84			76 84	1883.	"
R. & W. Conroy.....	95 42			95 42	1882-1883.	"
A. & P. White.....	101 00			101 00	1881	"
B. Caldwell & Son.....	4 33			4 33	1887.	"
J. R. Booth.....		398 88		10,270 81	1881 to 1888.	reported in return N-38, for March, 1886.
Perley & Patten.....		8,880 85		8,889 85	1881 to 1888.	"
The Bronsons & Weston Lumber Co.		8,180 79		8,180 79	1881 to 1888.	"
Pierce & Co.....		462 18		462 18	1888.	"
G. A. Grier & Co.....		1,060 50		1,060 50	1886-1887.	*Chaudière boonage. These parties claim that they have maintained these works wholly at their own expense since 1881.
Estate late Levi Young.....		1,461 20		1,461 20	1881 to 1885.	"
Wm. Mason.....		413 85		413 85	1881 to 1888.	"
Gilmour & Co.....		466 27		466 27	1884.	"
John Rochester.....		258 88		258 88	1881 to 1883.	"

## SESSIONAL PAPER No. 19

J. & G. Bryson, .....	23,987 28	31,006 54	252 20	252 20 1886 .....	Counter claim for damage by breaking of Coulonge Works.
			55,653 90		

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

EDWARD T. SMITH  
*Collector of Slide and Boom Dues.*

No. 2.—STATEMENT of Slide and Boom Dues accrued from the Ottawa River Works since July 1, 1889, Outstanding on September 30, 1905.

Name.	Year to which Dues belong.	Chaudiere Boonage in Suspense.	Ordinary Dues.	Total Outstanding	Remarks.
		\$ cts.	\$ cts.	\$ cts.	
J. R. Booth .....	1889-90	2,561 69	.....	2,561 69	Chaudiere boonage reported to Council, and referred to Treasury Board, should be written off.
The Ironsides & Weston L. Co., ..	1889-90	2,056 96	.....	2,056 96	
Perley & Partee .....	1889-90	1,203 26	.....	1,203 26	
Wm. Mason & Sons. ....	1889-90	167 66	.....	167 66	
Piero & Co. ....	1889-90	913 48	.....	913 48	Legal action taken to recover this.
Alex. Fraser Acc. Thos. Stephens ..	1890-91	.....	28 42	28 42	
J. R. Booth .....	1892-93	.....	379 80	379 80	Retained by Mr. Booth in settlement of an account due him which the Auditor General refuses to pay, as Mr. Booth appears to be in arrears in this and Statement No. 1.
Bryson & Fraser .....	1896	.....	196 71	196 71	Have counter claim for work done on slide to this amount. These two parties claim that as a slide on the Petawawa is not now used, no charge should be exacted.
J. R. Booth .....	1903-04	.....	339 27	339 27	
Hawkesbury Lumber Co .....	1903-04	.....	298 10	298 10	
		6,903 05	1,242 30	8,145 35	

EDWARD T. SMITH,  
*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

5-6 EDWARD VII., A. 1906

No. 3.—STATEMENT of Outstanding Slide Dues, Ottawa District, Bonds for which were sent to Quebec for Collection.

Name.	From 1860.	From 1861.	Total.
	\$ cts.	\$ cts.	\$ cts.
Hon. James Skead.....	245 00	210 00	455 00
James Mair.....		696 75	696 75
	245 00	906 75	1,151 75

These amounts were uncollected, as the parties claimed damages for loss caused by the Madawaska boom breaking in 1860.

A decision on their claims was not arrived at till August 2, 1869. On the 5th idem Messrs. Skead and Mair were notified that the department could not recognize their claim.

To the best of my knowledge, this decision was never communicated to the collector of slide dues, consequently these accounts remained in abeyance.

Since then both parties died, and I believe both were insolvent at the time of their death.

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

No. 4.—STATEMENT of the number of pieces of Square Timber, Saw-logs, &c., that passed through the Government Slides and Works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1905.

	Pieces.
Square timber.....	3,372
Saw-logs.....	4,404,675
Boom and dimension timber.....	137,780
Cedars.....	85,369
Railroad ties.....	636,120
Fence Posts.....	251,018
Total.....	5,518,334

Also 16,040.86-100 cords pulp wood

Revenue accrued on the above was \$44,652.03.

EWD. T. SMITH,  
*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

## SESSIONAL PAPER No. 19

No. 5.—STATEMENT showing the dues accrued on the undermentioned works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1905.

River or other Improvements.	Amount.
Main Ottawa.. . . .	\$ 2,563 84
Cheneaux Boom.. . . .	7,053 91
River Petewawa.. . . .	12,399 63
River Madawaska.. . . .	2,445 20
River Coulonge.. . . .	5,643 22
River Dumoine.. . . .	900 57
Black River.. . . .	6,892 04
Gatineau.. . . .	6,753 62

\$44,652 03

Amounting to \$44,652 03.

EWD. T. SMITH,  
*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

No. 6.—STATEMENT of Slide and Boom Dues from the St. Maurice Slides and Works outstanding on June 30, 1905, and remaining uncollected on September 30, 1905.

Name.	Year to which Dues belong.	Amount.	Total.	Remarks.
		\$ cts.	\$ cts.	
George Baptist, Son & Co.	1878	469 95		
"	1879	2,110 62		
"	1880	1,696 18		
"	1881	293 69		
"	1882	165 80		
"	1884	118 50		
"	1888	4 28		
			4,859 02	
Ross, Ritchie & Co	1878	3,072 84		
"	1883	2,173 68		
"	1884	28 96		
"	1886	1 62		
"	1887	4 38		
			5,281 48	
Alex. Baptist	1879		2,116 96	
Wm. Ritchie & Co	1888	779 24		
"	1889	332 11		
			1,111 35	
Ritchie Bros.	1886	413 43		
"	1887	634 71		
			1,048 14	
G. B. Hall.	1890		49 34	
T. E. Normand.	1890		42 28	
Treffle Biron	1891		0 92	
			14,481 49	

To make this balance agree with the Public Accounts, there should be deducted \$7.93 over credited Alex. Baptist, and \$217.17 added thereto, being \$190.40 paid July 23, 1884, and \$26.77 over charged in error to Wm. Little, not in any of the collector's returns, which will give balance due September 30, 1894, of \$14,690.73.

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.

5-6 EDWARD VII., A. 1906

No. 7.—STATEMENT of Slide and Boom Dues accrued from the Newcastle and Trent River Works, outstanding on June 30, 1904, and remaining uncollected September 30, 1905.

Name.	Year to which Dues belong.	Amounts disputed.	Ordinary Dues.	Total.	Remarks.
		8 cts.	8 cts.	8 cts.	
Irwin & Boyd.....	1881.....	59 79		59 79	Insolvent.
Thomson & McArthur.....	1880.....	52 78		52 78	
Jabez Thurston.....	1882.....	12 50		12 50	
McDougall & Ludgate.....	1879.....	65 07		65 07	
Bigelow & Trounce.....	1882 to 1885.....	216 21		216 21	Dead and estate distributed.
R. G. Strickland.....	1882, '83, '85, '86 and '87.....	215 08		215 08	
Est. late Geo. Hillard.....	1877 to 1883 and 1886.....	354 15		354 15	
T. G. Hazlett.....	1881, '82, '84 to '89.....	885 25		885 25	
J. M. Irwin.....	1882, '83, '85 to '88.....	698 45		698 45	According to judgment in Exchequer Court, <i>re</i> Boyd <i>vs.</i> Smith, these cannot be collected.
D. Ulyot.....	1881 to 1887.....	547 68		547 68	
Green & Ellis.....	1881 to '83, '85, '88 and '89.....	157 01		157 01	
A. W. Parkin.....	1884, '85, '88, '90 and '91.....	65 92		65 92	
The Dickson Estate.....	1883.....	137 50		137 50	Paid October 14, 1905.
Alfred McDonald.....	1888.....	40 80		40 80	
John Parkin.....	1889.....	13 00		13 00	
Gilmour & Co.....	1893, '94, '95, 1900, '01, '02, '03.....		4,766 92	4,766 92	
John Dovey.....	1894, '95, '96.....		35 70	35 70	Sent to Dept. of Justice for collection.
		3,521 19	4,802 62	8,323 81	

EDWARD T. SMITH,

*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,

OTTAWA, September 30, 1905.

SESSIONAL PAPER No. 19

## No. 8.—THE DRY DOCK AT ESQUIMALT, B.C.

STATEMENT of Dues and other Charges collected during the Year ending June 30, 1905.

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From	To			
		1904.	1904.	\$ cts.	\$ cts.	\$ cts.
Str. Caithness.....	3,503	July 25.	July 27..	511 00	5 40	516 40
H. M. S. Flora.....	4,360	Sept. 13.	Sept. 15..	130 24		130 24
S. S. Nevadan.....	4,408	Oct. 3..	Oct. 8..	916 00	9 00	925 00
H. M. S. Grafton.....	7,500	" 19..	" 24..	348 36		348 36
H. M. S. Bonaventure.....	4,360	" 24..	Nov. 1..	316 20		316 20
H. M. S. Shearwater...	980	Nov. 21.	Dec. 3..	460 95		460 95
		1905	1905			
H. M. S. Egeria.....	940	Mar. 2..	Mar. 9..	318 39		318 39
Overpaid.....				0 01		0 01
B. C. Stevedoring Co.....			Water supplied.....		2 40	2 40
S. S. Garonne.....	3,876	April 3..	April 5..	518 00	5 40	523 40
S. S. Victoria.....	3,502	May 22..	May 24..	511 00	10 20	521 20
H. M. S. Egeria.....	940	June 2..	June 8..	345 61		345 61
H. M. S. Shearwater.....	980	" 14..	" 16..	222 58		222 58
Tug Le Roi.....			Water supplied.....		1 80	1 80
	33,349			4,598 34	34 20	4,632 54

EDWARD T. SMITH,

*Collector of Public Works Revenue.*DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.



5-6 EDWARD VII., A. 1906

## No. 9.—THE DRY DOCK AT LEVIS, QUE.

STATEMENT of Dues and other Charges collected during the Year ending June 30, 1905.

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From	To			
		1904.	1904.	\$ cts.	\$ cts.	\$ cts.
S.S. Gauss .....	650	June 29..	July 2..	782 50	9 00	791 50
S.S. Verax .....		Entry Fee		200 00		200 00
S.S. Gauss.....	650	July 13..	July 15..	365 00	40 60	405 60
S.S. Verax .....	2,531	" 16..	" 25..	1,206 20	1,200 00	2,406 20
" .....		" 26..	Sept. 8..	4,427 28	9 00	4,436 28
S.S. Pordenskjold .....	3,572	Entry Fee		200 00		200 00
" .....		Oct. 6..	Nov. 6..	3,964 64	44 50	4,009 14
S.S. Bjorgrin.....	2,792	Entry Fee		200 00		200 00
" .....		Nov. 15..	Nov. 19..	623 36		623 36
S.S. Canada .....		Entry Fee		200 00		200 00
S.S. Savoy .....		"		200 00		200 00
			1905.			
(Wintering).....		Nov. 28..	April 25..	100 00	1 00	101 00
S.S. Lord Strathcona (Wintering) .....		" 28..	" 25..	300 00		300 00
S.S. Canada (Wintering).....		" 10..	" 25..	800 00		800 00
Dredge No. 6 and tug Monitor (Winter.).....		" 28..	" 25..	400 00	19 46	419 46
Dredge International (Wintering).....		" 28..	" 25..	400 00	101 84	501 84
			1905.			
Dredge J. I. Tarte.....	600	April 27..	May 9..	660 00		660 00
	10,795			15,028 98	1,425 40	16,454 38

EDWARD T. SMITH,

*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,

OTTAWA, September 30, 1905.

## SESSIONAL PAPER No. 19

## No. 10.—THE DRY DOCK AT KINGSTON, ONT.

## STATEMENT of Dues and other Charges collected during the Year ending June 30, 1905

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From	To			
		1904.	1904	\$ cts.	\$ cts.	\$ cts.
Yacht Lucille.....	41	Aug. 11.	Aug. 13..	50 00		50 00
Yacht Ramona.....	57	" 13..	" 14..	20 00		20 00
Str. John Milne.....	109	" 15..	" 15..	21 80		21 80
Str. Cardinal.....	237	" 15..	" 15..	47 40		47 40
Tug D. G. Thompson.....	137	" 23..	" 24..	47 40	5 00	52 40
Govt. dredge Sir Richard.....	125	Sept. 12..	Sept. 14..	55 50		55 50
Str. John Milne.....	109	" 29..	" 30..	21 80		21 80
Government steamer Scout.....	180	" 14..	" 16..	56 00		56 00
" " Reserve.....	49	" 16..	" 18..	40 00		40 00
Barge Columbia.....	84	Oct. 10..	Oct. 11..	20 00		20 00
Steam barge King Ben.....	145	Nov. 2..	Nov. 3..	29 00		29 00
Str. India.....	976	" 17..	" 18..	158 10		158 10
Str. Hecla.....	1,110	" 21..	" 23..	238 70		238 70
Str. New Island Wanderer.....	123	" 23..	" 28..	94 60		94 60
Str. Avon.....	1,417	" 29..	Dec. 2..	390 08		390 08
Str. Spartan.....			" 23..	100 00		100 00
			1905.			
".....	946	Dec. 13..	April 7..	780 00	10 00	790 00
Dredge Nipissing.....	105	" 13..	Mar. 13..	280 50		280 50
			1905.			
Tug Trudeau.....	75	April 13..	April 24..	200 00		200 00
Str. Advance and tug Jessie Hall.....	1,087	" 25..	" 26..	158 70	11 50	170 20
Str. Resolute.....	372	" 27..	" 28..	74 40		74 40
Schr. Oliver Mowat.....	198	" 27..	" 28..	39 60		39 60
SS. Turbinia.....	1,064	" 28..	" 28..	156 40		156 40
Barge Ceylon.....	908	May 5..	May 6..	140 80		140 80
Str. Cardinal.....	237	" 11..	" 14..	97 40	5 00	102 40
Str. Cuba.....	1,231	" 14..	" 15..	173 10		173 10
Str. Argyle.....	700	" 16..	" 17..	120 00		120 00
Str. New Island Wanderer.....	123	June 25..	June 26..	24 60		24 60
	11,945			3,635 88	31 50	3,667 38

EDWARD T. SMITH,  
Collector of Public Works Revenue.

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1905.



PART VII.

MISCELLANEOUS

ACTS OF PARLIAMENT, PASSED AT SESSION OF 1905, HAVING REFERENCE TO THIS DEPARTMENT.

CONTRACTS LET BY THIS DEPARTMENT.

PROPERTY PURCHASED OR SOLD.

PROPERTY, LEASED TO OR BY THE DEPARTMENT.

CURATOR'S REPORT, NATIONAL ART GALLERY.

NAMES OF CHIEF OFFICERS OF THE DEPARTMENT.

NAMES OF OFFICIALS EMPLOYED ON SLIDES AND BOOMS.

NAMES OF PERSONS employed on GRAVING DOCKS.

NAMES OF ENGINEERS, FIREMEN AND CARETAKERS OF PUBLIC BUILDINGS.

AND THE OFFICIAL CORRESPONDENCE OF THE DEPARTMENT.

FOR THE

FISCAL YEAR ENDED JUNE 30, 1905.



## DEPARTMENT OF PUBLIC WORKS,

OTTAWA, December 30, 1905.

F. GÉLINAS, Esq.,

Secretary, Department of Public Works,  
Ottawa.

SIR,—I have the honour to send you herewith the following statements concerning the transactions of the department during the last fiscal year with respect to contracts and property, and which are required for insertion in the annual report of 1904-05, viz.:—

No. 1.—Statement of contracts let by this department during the fiscal year ended June 30 last.

No. 2.—Statement of property purchased and sold by this department during the same period.

No. 3.—Statement of property leased to and by the said department during the same period ; and

No. 4.—A list of some of the Public Acts of the Parliament of Canada passed at the last session having reference to the department.

I have the honour to be, sir,

Your obedient servant,

J. A. CHASSE,

*Law Clerk.*





# STATEMENTS

SHOWING

1ST.—CONTRACTS LET BY THE DEPARTMENT OF PUBLIC WORKS OF CANADA, FROM JUNE 30, 1904 TO JUNE 30, 1905.

2ND.—PROPERTY PURCHASED OR SOLD BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1905.

3RD.—PROPERTY LEASED TO AND BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1905.

I have the honour to be, sir,

Your obedient servant,

J. A. CHASSE,

*Law Clerk.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, December 30, 1905.



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS— <i>Continued.</i>			\$ cts.
<i>New Brunswick.</i>			
Bathurst, Post Office. Supply of coal	G. E. Mercier	Sept. 12, 1904	432 35
Campbellton, Public Building—Construction of	Harquail & Harquail	" 30, 1904	16,600 00
Chatham " Supply of coal	Edward Johnson	" 8, 1904	359 77
Dalhousie " " "	G. E. Mercier	" 12, 1904	275 64
Fredericton " " "	Hott, Morrison & Co.	" 12, 1904	243 16
" Drill Hall—Addition to	C. J. B. Simmons	Dec. 7, 1904	12,955 00
Marysville, Public Building. Supply of coal	Hott, Morrison & Co.	Sept. 12, 1904	122 59
Moncton " Tower clock	Z. M. Leger	Aug. 3, 1904	675 00
" " Supply of coal	The Minudie Coal Co.	Sept. 10, 1904	313 06
Newcastle " " "	Byron N. Call	" 5, 1904	420 82
Partridge Island, Quar. Station Construction of hospital	Geo. McArthur	Aug. 26, 1904	9,868 00
" " " Detention build- ings.	"	" 26, 1904	16,995 00
" " " Additional work to hospital	"	Dec. 12, 1904	950 00
" " " Detention bldg. No. 1. Heating apparatus.	"	March 15, 1905	3,100 00
" " " Detention bldg. No. 2. Heating apparatus.	"	" 15, 1905	3,100 00
St. John, Quarantine Station works	P. Campbell & Co.	Nov. 11, 1904	1,087 00
" Custom House. Supply of coal	Vroom & Arnold	Sept. 19, 1904	1,703 19
" Post Office building " "	The Minudie Coal Co.	" 10, 1904	20 10
" " " " "	R. P. & W. F. Starr	" 10, 1904	42 93
" Savings Bank " "	"	" 10, 1904	20 27
" West, Post Office " "	Vroom & Arnold	" 9, 1904	36 00
" City " "	"	" 9, 1904	713 65
" Immigrant Building " "	"	" 9, 1904	1,278 75
" Savings Bank " "	"	" 9, 1904	237 59
St. Stephens, Public Building " "	A. I. Teed Co.	" 12, 1904	159 60
Sussex " " "	Thomas H. Brown	" 3, 1904	375 05
Tracadie, Lazaretto " "	Vroom & Arnold	Oct. 4, 1904	968 39
Woodstock, Post Office " "	W. F. Dibblee & Son	Sept. 14, 1904	336 41
" Drill Hall—Construction of	Williamson Fisher	Oct. 25, 1904	31,980 00
<i>Quebec.</i>			
Acton Vale, Public Building. Heating apparatus	Joseph Bourque	March 23, 1905	950 00
Aylmer, Post Office building. Supply of coal	J. G. Butterworth	Sept. 12, 1904	228 50
Berthierville " " " "	Lamarche & Boulanger	" 12, 1904	95 64
Buckingham " " " "	McCullough & Co.	Oct. 5, 1904	118 20
Coaticook, Post Office building. Supply of coal	B. J. Smith	Sept. 5, 1904	239 67
Drummondville " " " "	The Pennsylvania Coal Co.	Oct. 6, 1904	160 00
Dundee, Custom House " "	Allen S. Matthews	Sept. 10, 1904	31 75
Farnham, Public Building " "	A. B. Comeau & Co.	" 12, 1904	50 80
Fraserville " " " "	Nap. Dion	" 6, 1904	330 00
Granby, Tower Clock " "	H. Birks & Sons	May 2, 1905	1,102 00
" Public Building. Supply of coal	P. Phoenix	Sept. 3, 1904	243 25
Hochelaga " " " "	Wilson Freres	" 20, 1904	171 50
Hull " " " "	J. B. Gratton	May 13, 1905	1,302 00
Joliette " " " "	The Hull Coal Co.	Aug. 31, 1904	452 65
Lachine " " " "	S. Bourgeois	Sept. 5, 1904	327 91
Laprairie " " " "	A. G. Evans	" 8, 1904	103 20
L'Assomption " " " "	J. B. H. Beauvais	" 5, 1904	163 81
Levis " " " "	Louis Desmarais	" 5, 1904	213 50
Longueuil, Construction of a Post Office Building	Joseph Couture	Feb. 3, 1905	22,000 00
Longueuil, Construction of a Public Building	Joseph Bourque	Sept. 28, 1904	10,500 00
Montreal, Supply of 8,000 lineal ft. of piping re Postal Pneumatic System	R. McLaren & Co.	Feb. 9, 1905	11,600 00
Montreal, Examining Warehouse—Additions, &c., to	J. B. Pauzé & Co.	April 26, 1905	4,500 00

5-6 EDWARD VII., A. 1906

## No. 1.—CONTRACTS let by the Department of Public Works, &amp;c.—Continued.

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS—Continued.			8 cts.
Quebec.—Concluded.			
Montreal, Examining Warehouse—Boilers. ....	The Underfeed Stoker Co., Ltd. ....	March 25, 1905	2,175 00
Montreal, Examining Warehouse. Supply of coal	A. Baile. ....	Aug. 31, 1904	1,980 00
" Custom House " "	" " " "	31, 1904	690 57
" Post Office Building " "	" " " "	31, 1904	889 00
" Revenue Building " "	" " " "	31, 1904	254 00
Quebec, Iron Foundry, Dom. Arsenal. Elec. wiring	Chs. Vézina. ....	Oct. 31, 1904	975 00
" Immigration Building " "	The Slade Elect. Co. ....	May 10, 1905	1,500 00
" Custom House. Supply of coal. ....	A. R. Pruneau & Co. ....	Sept. 1, 1904	46 23
" Immigrant Shed " "	" " " "	1, 1904	45 50
" St. Roch P. O. Building " "	" " " "	1, 1904	
" Cullers' Office " "	Martin Madden. ....	Aug. 30, 1904	309 50
" Custom House " "	" " " "	30, 1904	786 90
" Marine Agency " "	" " " "	30, 1904	513 80
" Examining Warehouse " "	" " " "	30, 1904	669 86
" Immig. Office " "	" " " "	30, 1904	226 62
" Post Office " "	" " " "	30, 1904	688 69
" Gov. General's Quarters " "	" " " "	30, 1904	666 55
Richmond, Public Building " "	J. D. Smith. ....	Sept. 5, 1904	263 28
St. Henri " "	Citizens Coal Co. ....	" 16, 1904	103 66
St. Hyacinthe, Post Office " "	T. E. Fee & Son. ....	" 10, 1904	284 34
" Inland Revenue " "	" " " "	10, 1904	225 20
" Construction of a Drill Hall. ....	Paquet & Godbout. ....	March 25, 1905	50,000 00
" Drill Hall. Timber foundations. ....	" " " "	May 12, 1905	5,708 00
St. Jérôme, Post Office Building. Supply of coal	Chs. Godmer. ....	Sept. 7, 1904	255 00
St. John's, " " " "	Jules Audette. ....	Sept. 7, 1904	102 60
St. Louis du Mile End, Construction of Post Office Building. ....	J. B. Pauzé & Co. ....	Aug. 23, 1904	18,790 00
" Heating apparatus. ....	" " " "	Feb. 17, 1905	1,422 00
Sherbrooke, Public Building. Supply of coal. ....	Jean Huot. ....	Sept. 22, 1904	446 95
" Post Office. Fittings. ....	Simoneau & Dion. ....	Oct. 25, 1904	640 00
Sorel, Public Building. Supply of coal. ....	Alfred Lavallee. ....	Sept. 3, 1904	326 50
Thetford Mines, Post Office. " "	La Cie Savoie-Guay. ....	Sept. 12, 1904	266 00
" Public Building. Fittings. ....	J. S. Hebert. ....	May 25, 1905	1,185 00
" Heating apparatus " "	A. Beauchesne. ....	Oct. 28, 1904	1,125 00
Terrebonne, Construction of Post Office building	E. Paquet. ....	Nov. 25, 1904	11,550 00
Three Rivers, Custom House. Heating and plumbing works. ....	Geo. Morissette. ....	Oct. 20, 1904	1,450 00
" Construction of a Drill Hall. ....	Joseph Bourque & Co. ....	May 1, 1905	52,500 00
" Custom House. Supply of coal. ....	The Three Rivers Coal and Trans. Co. ....	Aug. 31, 1904	42 15
Valleyfield, Public Building. Heating apparatus	T. Bélanger & Co. ....	Dec. 24, 1904	3,975 00
" " Supply of coal. ....	Besner & Chasle. ....	Sept. 12, 1904	335 05
Victoriaville " " " "	F. Beauchesne. ....	Sept. 9, 1904	170 07
Ontario.			
Alexandria, Public Building. Supply of coal. ....	Angus McDonald. ....	Sept. 3, 1904	185 07
" Post Office. Fittings. ....	W. G. Row. ....	Feb. 16, 1905	381 00
" Public Building. Heating apparatus	Martel & Langelier. ....	Nov. 19, 1904	890 00
Almonte, Public Building. Supply of coal. ....	Wm. McArthur. ....	Sept. 3, 1904	202 55
Amherstburg, " " " "	Falls Bros. ....	Sept. 3, 1904	210 94
Arnprior, Post Office building. ....	J. S. Moir. ....	Sept. 10, 1904	411 70
Barrie, Public Building. Supply of coal. ....	J. G. Scott. ....	Sept. 12, 1904	222 25
Belleville, " " " "	The Downey Coal Co. ....	Sept. 6, 1904	615 00
" " Fixtures. ....	Greenleaf & Son. ....	June 20, 1905	840 00
Berlin, " Supply of coal. ....	C. A. Wilson & Co. ....	Sept. 6, 1905	302 73
" " Fittings. ....	Ruben Bowman. ....	May 15, 1905	1,908 00
Bowmanville, " Supply of coal. ....	C. A. Wilson & Co. ....	Sept. 6, 1904	243 25
" Heating apparatus. ....	Wm. Stuart. ....	Aug. 17, 1904	1,950 00
Brampton " Supply of coal. ....	Peaker & Son. ....	Sept. 12, 1904	182 20
Brantford " " " "	C. A. Wilson & Co. ....	Sept. 6, 1904	427 46
" Post Office. Fittings and alterations. ....	The Schultz Bros. Co. Lt. ....	Nov. 21, 1904	3,295 00

## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract	Amount.
PUBLIC BUILDINGS.— <i>Continued.</i>			
Ontario— <i>Continued.</i>			\$ cts.
Brantford Armoury. Heating apparatus.....	Chs. Taylor & Co.....	Dec. 21, 1904	2,600 00
" Drill Hall. Electric wiring.....	Schultz Bros.....	April 27, 1905	2,450 00
Bridgeburg, Construction of Post Office, &c. Bldg	Cutler & Vanderburg.....	Oct. 3, 1904	15,115 00
Brockville, Post Office. Supply of coal.....	Central Canada Coal Co.....	Sept. 7, 1904	419 75
" " Alterations.....	Enoch Smith.....	Feb. 3, 1905	2,138 40
Burford, Construction of an Armoury.....	Nagle & Mills.....	Sept. 19, 1904	9,900 00
Carleton Place, Post Office. Supply of coal.....	Taylor, Bros. & Co.....	Sept. 12, 1904	155 00
Cayuga, Public Building. ".....	C. A. Wilson & Co.....	Sept. 6, 1904	107 20
Cathlamet, " " ".....	A. R. Crow.....	Sept. 6, 1904	286 99
" Construction of a Drill Hall.....	John Piggott & Sons.....	Jan y. 30, 1905	50,905 00
" Armoury, Shooting Gallery and Bowl- ing Alley. " " ".....	" " ".....	May 4, 1905	3,200 00
" Public Building. Renovation of heating apparatus " " ".....	" " ".....	Sept. 9, 1904	790 00
Clinton, Public Building. Supply of coal.....	Martel & Langelier.....	Sept. 9, 1904	90 74
Cobourg, " " ".....	C. A. Wilson & Co.....	" " ".....	244 15
" " Interior fittings.....	Geo. Plunkett.....	Sept. 6, 1904	1,780 00
" " ".....	C. Caruthers.....	Fel. 17, 1905	4,895 00
" " ".....	D. Booth.....	April 20, 1905	300 00
Cornwall, Post Office. Supply of coal.....	A. F. Mulhern & Co.....	Sept. 12, 1904	272 94
Deseronto, " " ".....	The Rathbun Co.....	Sept. 2, 1904	53 87
Dundas, Public Building. ".....	Chs. Sturrock.....	Nov. 11, 1904	800 00
Fort William, " Installation of wires, &c.	C. D. Cole.....	Sept. 12, 1904	579 00
" " ".....	James Murphy.....	Sept. 10, 1904	223 30
Galt, " " ".....	John Brownlee & Co.....	June 28, 1905	6,550 00
" " ".....	Archd. McAuslan.....	Sept. 12, 1904	148 40
Gananoque, Custom House. Supply of coal.....	The Rathbun Co.....	Sept. 12, 1904	102 40
" " ".....	Wm. Lee.....	Sept. 10, 1904	277 55
Goderich, " " ".....	C. A. Wilson & Co.....	Sept. 6, 1901	228 17
Guelph, " " ".....	Stevenson & Malcolm.....	Sept. 17, 1904	2,595 00
" " ".....	John Kennedy.....	Feb. 20, 1905	4,135 00
Hamilton, " " ".....	The Rogers Coal Co.....	Sept. 16, 1904	1,156 75
" " ".....	" " ".....	Sept. 16, 1904	11,500 00
Hawkesbury, Construction of Public Building.....	R. Cameron.....	Jan. 18, 1905	227 50
Ingersoll, Public Building. Supply of coal.....	Nagle & Mills.....	Sept. 12, 1904	5 50
" " ".....	C. A. Wilson & Co.....	Sept. 6, 1904	180 90
Kingston, Custom House. ".....	P. Walsh.....	Sept. 6, 1904	268 00
" " ".....	" " ".....	Sept. 6, 1904	5,980 00
" " ".....	D. S. Booth.....	April 8, 1905	6,990 00
" " ".....	H. W. Watts.....	May 9, 1905	203 16
Lindsay, Public Building. Supply of coal.....	C. A. Wilson & Co.....	Sept. 6, 1904	700 51
London, " " ".....	" " ".....	Sept. 6, 1904	672 09
" " ".....	" " ".....	Sept. 6, 1904	9,300 00
" " ".....	" " ".....	Aug. 18, 1904	2,495 00
" " ".....	" " ".....	" " ".....	4,750 00
" " ".....	" " ".....	" " ".....	27,290 00
London, Post Office. Alterations and additions.....	Wm. Tytler.....	Apr. 11, 1905	135 00
Napanee, Public Building. Supply of coal.....	F. E. Van Luen.....	Sept. 14, 1904	156 90
Niagara Falls " " ".....	H. E. Thomas.....	" 12, 1904	170 88
Orangeville " " ".....	James R. Lathwell.....	" 12, 1904	167 50
Orillia " " ".....	The Sarjeant Co.....	" 12, 1904	20,500 00
Oshawa, Construction of a Post Office, etc., b'd'g.	Wm. J. Trick.....	" 2, 1904	1,197 28
Ottawa, Experimental Farm. Supply of coal.....	McCullough & Co.....	Aug. 30, 1904	54,471 59
" " ".....	John Heney & Son.....	June 9, 1905	7,800 00
" " ".....	The Fensom Elevator Co. Ltd.....	July 14, 1904	19,600 00
" " ".....	Doran & Devlin.....	" 24, 1904	Per s. y. 2 25
" " ".....	Warren Bituminous Pav- ing Co.....	Sept. 6, 1904	49,857 0
" " ".....	W. H. McGillivray.....	" 29, 1904	1,231 0
" " ".....	Alex. Fleck Ltd.....	" 25, 1904	

## SESSIONAL PAPER No. 19

## No. 1.—CONTRACTS let by the Department of Public Works, &amp;c.—Continued.

Works.	Names of Contractors.	Date of Contract	Amount.
PUBLIC BUILDINGS—Continued.			\$ cts.
Ontario—Concluded.			
Ottawa Construction of Royal Victoria Museum.	Geo. Goodwin.....	Dec. 28, 1904	950,000 00
" " Mint .....	Sullivan & Langdon.....	Jan. 5, 1905	263,194 00
" Printing Bureau. Electric light wiring and fittings .....	P. E. Marchaud & Co.....	Mar. 20, 1905	3,575 00
" Government House. Supply and filling the ice house.....	J. O. Charlebois & Co....	" 25, 1905	P. bl. 1x1x 3 ft. 0 18
" Royal Victoria Museum. For drain .....	Geo. Goodwin.....	" 16, 1905	4,500 00
" Western Block. Additions and alterations to .....	" .....	Apl. 10, 1905	75,000 00
" Printing Bureau. Additional story.....	Doran & Devlin.....	May 12, 1905	43,200 00
" Transit House. Construction of .....	Wm. H. McGillivray & P. Labelle .....	" 15, 1905	14,789 00
" Observatory. Steel fittings. ....	The Office Speciality Mfg. Co. Ltd.....	" 16, 1905	4,356 50
" Post Office. Stone carving.....	W. Dawson & J. Crosbie .....	Apl. 2, 1905	2,175 00
" Observatory. Steel cases. ....	The Office Speciality Mfg. Co. Ltd.....	June 3, 1905	2,254 00
" Public Buildings. Steel cases. ....	The Eclipse Mfg. Co. Ltd .....	" 12, 1905	4,370 00
Paris, Public Building. Supply of coal .....	Geo. E. Taylor.....	Sept. 9, 1904	132 57
Pembroke, " " .....	Mackie & Ryan.....	" 2, 1904	294 00
Peterborough, Post Office " .....	C. A. Wilson & Co.....	" 6, 1904	239 39
" Custom House " .....	" .....	" 6, 1904	196 29
" Public Building. Alterations to .....	D. Belleghem.....	Apl. 6, 1905	4,925 00
Petrolia, Post Office. Supply of coal .....	C. A. Wilson & Co.....	Sept. 6, 1904	168 29
Pictou, Public Building " .....	Lake & Kilhip.....	" 13, 1904	214 50
Port Arthur " " .....	Louis Walsh Coal Co.....	" 7, 1904	200 00
" " Supply of water .....	Corporation of Port Arthur.....	Jan. 30, 1905	Per an. 37 00
Port Colborne " Fittings.....	J. E. Cutler.....	Mar. 30, 1905	675 00
Port Hope " Supply of coal .....	Brown & Co.....	Sept. 12, 1904	248 00
Prescott, Post Office " .....	James Buckley .....	" 5, 1904	225 25
" Custom House. " .....	" .....	" 5, 1904	103 50
Rat Portage, Post Office. Supply of coal.....	D. E. Adams.....	" 14, 1904	468 18
St. Catharines, Post Office " .....	C. A. Wilson & Co.....	" 6, 1904	184 50
" Drill Hall. Mastic Asphalt floor .....	Sullivan & Langdon.....	May 12, 1905	3,609 00
St. Thomas, Post Office. Supply of coal .....	C. A. Wilson & Co.....	Sept. 6, 1904	325 00
Sandwich. Construction of Post Office .....	Geo. A. Proctor.....	June 12, 1905	11,484 00
Sarnia, Post Office. Supply of coal .....	C. A. Wilson & Co.....	Sept. 6, 1904	293 25
Sault Ste Marie, Post Office. Heating apparatus.	McPhail, McCarty & Wright .....	Dec. 7, 1904	4,200 00
Smith's Falls, Public Building. Supply of coal ..	Thomas Graham.....	Sept. 12, 1904	192 50
Stratford, Post Office " .....	Angus Johnson & Co.....	" 13, 1904	479 00
" Construction of an armoury.....	Nagle & Mills .....	Nov. 25, 1904	47,793 00
Strathroy, Public Building. Supply of coal .....	R. Nicholson.....	Sept. 12, 1904	175 65
Toronto Junction, Post Office. Heating apparatus.	Martel & Langelier.....	" 2, 1904	1,425 00
" " Fittings .....	T. P. Wright & Son.....	Nov. 21, 1904	2,936 00
" " and Custom House. " .....	" .....	" .....	" .....
" " Wiring and fixtures.	Jones & Moore Electric Co. Ltd.....	Oct. 20, 1904	650 00
Toronto. Supply of 36,000 lineal ft. piping re Postal Pneumatic System.	R. MacLaren & Co.....	Feb. 9, 1905	52,200 00
Toronto, Postal Station " C ". Works caretakers quarters .....	The Carlyle Construction Co. Ltd.....	" 24, 1905	2,350 00
Trenton, Public Building. Supply of coal. ....	Chs. Crowe.....	Sept. 9, 1904	196 35
Walkerton, Post Office " .....	C. A. Wilson & Co.....	" 6, 1904	212 83
Windsor " " .....	" .....	" 6, 1904	53 50
" " " .....	J. & T. Hurley.....	" 3, 1904	429 00
" " New entrance and steps and approaches to .....	Excelsior Granite & Marble Works.....	Apl. 25, 1905	2,000 00
Woodstock, Public Building. Supply of coal ...	The McIntosh Coal Co.....	Sept. 9, 1904	257 36
" Armoury. Construction of .....	Nagle & Mills .....	Nov. 25, 1904	47,935 00

## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS— <i>Concluded.</i>			\$ cts.
<i>Manitoba.</i>			
Brandon, Post Office. Supply of coal.....	R. Purdon.....	Sept. 11, 1904	961 00
" Experimental Farm. Supply of coal....	" ".....	" 11, 1904	236 88
Portage LaPrairie, Pub. Build'g ".....	D. E. Adams.....	" 14, 1904	517 33
Virden. Construction of an Armoury.....	W. H. Ireland.....	Dec. 14, 1904	6,449 00
Winnipeg, Post Office. Supply of coal.....	Harstone Bros.....	Sept. 13, 1904	2,213 77
" Immigration Hall. Supply of coal.....	D. E. Adams.....	" 14, 1904	622 01
" Hospital ".....	" ".....	" 14, 1904	115 43
" Custom House ".....	" ".....	" 14, 1904	733 49
" Immig. Office and shed ".....	" ".....	" 14, 1904	
" Indian Off. and T.C. Off. ".....	" ".....	" 14, 1904	
" Examining Warehouse ".....	" ".....	" 14, 1904	523 70
" Immig. Hospital. Heating apparatus.....	Cotter Bros.....	Aug. 15, 1904	1,678 70
" Construction of Immigration Build'g.....	The Manitoba Construction Co. ....	" 23, 1904	147,000 00
" Immigrat. Hall. Heating apparatus.....	Cotter Bros.....	Oct. 10, 1904	3,100 00
" Post Office Building. Excavation to.....	W. F. Lee.....	Nov. 22, 1904	4,993 00
" Construction of a Magazine.....	J. & J. McDiarmid.....	Dec. 14, 1904	4,000 00
" Immigration Building, fire-proof floors.....	Expanded Metal and Fire Proofing Co., Ltd.....	Jan. 13, 1904	15,750 00
" Construction of a Post Office Building.....	Kelly Bros. & Co.....	Feb. 24, 1905	529,485 00
" Construction of a Military Store Building.....	J. & J. McDiarmid.....	May 16, 1905	23,925 00
<i>North-west Territories.</i>			
Calgary, Post Office. Supply of coal.....	C. S. Lott.....	Oct. 22, 1904	369 52
" Immigrant Shed ".....	" ".....	" 22, 1904	80 63
" Court House ".....	" ".....	" 22, 1904	604 05
" Registry Office ".....	" ".....	" 22, 1904	
Carnduff, Court House ".....	Fairbairn Bros.....	Sept. 23, 1904	126 85
Edmonton ".....	J. Milner & Co.....	" 20, 1904	
" Dominion Land ".....	" ".....	" 20, 1904	180 00
Indian Head, Experimental Farm ".....	Windatt & Co.....	" 6, 1904	264 00
" ".....	Geo. Thompson.....	" 15, 1904	80 00
Lethbridge, Post Office ".....	The Alberta Ry. and Coal Co.....	" 15, 1904	97 50
Macleod, Court House ".....	A. F. Grady.....	" 7, 1904	561 09
" Custom House ".....	" ".....	" 7, 1904	509 78
Moose Jaw, Court House ".....	R. Beard.....	" 12, 1904	182 22
" Construction of Public Building.....	Pat. Navin.....	Jan. 13, 1905	22,913 00
Moosomin, Court House. Supply of coal.....	T. H. Bristow.....	Sept. 16, 1904	147 88
" ".....	Windatt & Co.....	" 6, 1904	268 31
Prince Albert. Construction of a Public Building.....	C. LeMoine & F. R. Fortin.....	Jan. 21, 1905	79,725 00
Red Deer, Court House. Heating apparatus.....	Morrison & Johnston.....	May 2, 1905	1,435 00
" " Supply of Coal.....	Smith & Gaetz.....	Sept. 13, 1904	
" Dominion Land Office ".....	" ".....	" 13, 1904	
Regina ".....	Whitmore Bros.....	" 7, 1904	430 67
" Court House ".....	" ".....	" 7, 1904	698 75
" Post Office ".....	" ".....	" 7, 1904	325 70
" ".....	The Smith & Ferguson Co.....	" 24, 1904	38 10
" Court House ".....	" ".....	" 24, 1904	37 55
" Dominion Land ".....	" ".....	" 24, 1904	52 50
Wolseley, Court House ".....	Windatt & Co.....	" 6, 1904	380 18
Yorkton ".....	The Alberta Ry. and Coal Co.....	" ".....	
" Immigrant Shed ".....	" ".....	" 9, 1904	
<i>British Columbia.</i>			
Nanaimo, Public Building. Heating apparatus.....	The Vanstone Heating and Plumbing Co., Ltd.....	June 20, 1905	1,650 00
Nelson. Construction of corral and dipping vat.....	John Burns.....	April 5, 1905	1,058 00
Rossland, Armoury. Heating apparatus.....	W. G. Gillett.....	May 11, 1905	1,597 00



5-6 EDWARD VII., A. 1906

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
HARBOURS AND RIVERS.			\$ cts.
<i>Nova Scotia.</i>			
Breton Cove, construction of boat landing wharf.	Reid & Archibald.	July 14, 1904	5,885 00
Devil's Island, construction of breakwater.	"	June 19, 1905	5,980 00
Freeport, construction of public breakwater.	J. E. & H. Bigelow.	" 22, 1905	13,700 00
Garabus, extension to breakwater.	Heney & Smith.	May 4, 1905	19,009 00
Glace Bay, improvements in the harbour of.	The Dominion Coal Co., Ltd.	Oct. 19, 1904	25,000 00
Main à Dieu, breakwater.	Reid & Archibald.	Aug. 27, 1904	8,925 00
North Gut, St. Ann's wharf.	Duncan Guthrie.	Sept. 29, 1904	1,850 00
Port Greville, extension to breakwater.	T. P. Charleson.	Dec. 12, 1904	11,460 00
Skinner's Cove, channel protection works.	Wm. J. Landry.	Jan. 5, 1905	10,965 00
<i>Prince Edward Island.</i>			
Grand River, extension to wharf.	McNeill, Arsenault & Pembroke.	Dec. 27, 1904	3,155 00
McPherson's Cove, wharf.	Thomas Campbell.	" 28, 1904	8,999 00
<i>New Brunswick.</i>			
Campbellton, wharf.	C. J. B. & S. D. Simmons.	Oct. 11, 1904	35,300 00
Dalhousie, deep water wharf.	J. B. McManus, Ltd.	Aug. 1, 1904	42,000 00
Dipper Harbour, breakwater.	J. J. Lyons & J. White.	Sept. 21, 1904	45,485 00
*Durham, wharf.	John & Joseph Goulette.	June 20, 1905	17,700 00
<i>Quebec.</i>			
Anse à la Grosse Roche, wharf.	Boivin & Côté.	Aug. 16, 1904	9,500 00
Chambord, wharf.	A. Du Tremblay.	Sept. 22, 1904	9,250 00
Deschambault, landing pier.	Théophile Bernier.	Dec. 16, 1904	15,840 00
Grondines, wharf.	J. Alphonse Lemay.	March 24, 1905	14,500 00
New Richmond, landing wharf.	J. Burns & T. P. Charleson.	July 8, 1904	14,400 00
Percé, extension to pier.	J. J. Lyons & J. White.	Oct. 31, 1904	19,441 20
Repentigny, landing pier.	Lachance Bros.	Aug. 10, 1904	10,975 00
St. Alexis, wharf.	Geo. Perron.	Jan. 4, 1905	17,485 00
St. Fidèle, wharf (close-faced timber).	Tremblay & Savard.	Oct. 26, 1904	15,266 00
St. Gédéon les Îles, wharf.	A. Beaulieu.	July 13, 1904	8,990 00
St. Jean des Chaillons, landing pier.	Chas. Page.	Sept. 21, 1904	33,233 75
St. Siméon, approach to isolated crib.	Nap. Trudel.	Oct. 28, 1904	19,062 67
<i>Ontario.</i>			
Amherstburg, dredging of channel.	The Weddell Dredging Co.	Dec. 9, 1904	27,600 00
Barry's Bay, wharf and approaches.	John D. McRae.	Aug. 9, 1904	4,433 00
Bracebridge, crib wharf.	John Baker.	Oct. 21, 1904	8,200 00
Echo Bay, pile wharf with stone causeway approach.	Wm. Birmingham.	Dec. 14, 1904	17,476 00
Goderich, breakwater.	Battle & Conlon.	Aug. 8, 1904	74,000 00
Meaford "	Kastner & Porter.	" 23, 1904	59,800 00
Parry Sound, pile wharf.	A. A. McDonald.	April 17, 1905	8,925 00
Petawawa, pile wharf with approach.	Chs. LeMoine & F. Fortin.	Dec. 26, 1904	6,197 00
Stokes' Bay, wharf and road approach.	Kastner & Porter.	Sept. 29, 1904	8,500 00
Thessalon, wharf of cribwork with stone and ground approach.	O'Boyle Bros.	July 14, 1904	19,000 00
<i>North West Territories.</i>			
Battleford, concrete piers and abutments.	John Foley.	April 4, 1905	38,426 00

\* Contract assigned to J. &amp; A. Culligan.

## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Concluded.*

Works.	Names of Contractors.	Date of Contract	Amount.
HARBOURS AND RIVERS— <i>Concluded.</i>			\$ cts.
<i>Vessels, dredges and plant.</i>			.
Construction of steel hopper barge for dredge <i>Cape Breton</i> .....	I. Matheson & Co., Ltd.	Aug. 8, 1904	10,500 00
Construction of steel tow boat for Fraser River...	The Victoria Machinery Dept. Co., Ltd.....	Aug. 8, 1904	24,750 00
Construction of a two, yard dipper dredge.....	The Bertram Engine Works Co., Ltd.....	Aug. 17, 1904	49,350 00
Construction of an hydraulic dredge.....	The Polson Iron Works..	Aug. 18, 1904	138,560 00
Construction of a snag boat for Fraser River.....	Wm. Turpel.....	Aug. 19, 1904	22,500 00
Construction of a hopper barge for dredge <i>Cape Breton</i> .....	The Pictou Foundry & Machine Co. ....	Sept. 25, 1904	9,850 00
Construction of steel stone lifter.....	The Bertram Engine Works, Ltd .....	March 25, 1905	36,985 00
Construction of two tubular boilers, for Examining Warehouse, Montreal.....	Jos. Thibault.....	June 10, 1905	5,763 00

J. A. CHASSÉ,  
*Law Clerk.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, December 30, 1905

5-6 EDWARD VII., A. 1906

No. 2.—STATEMENT of properties purchased or sold by the Department of Public Works during the Fiscal Year ended June 30, 1905.

Date of Conveyance.	Vendors.	Purchasers.	Description of Property.	For what Purpose.	Area.	Price.
						cts.
1904.						
July		His Majesty	Lot No. 17, Hawkesbury, Ont.	Site—Public building.	100 x 90 ft.	3,000 00
"	"	"	Lot No. 100, Notre Dame du Portage, P. Q.	Wharf	9 perches 84 ft.	100 00
"	"	Federal Government	Lot No. 24, Rustico Harbour, P. E. I.	Breakwater		1 00
"	"	His Majesty	Land, Grand Plage, N. S.	Wharf		1,000 00
"	"	"	Part of Lot 16, Bracebridge, Ont.	"	1½ acre.	675 00
"	"	"	Lots Nos. 1, 2, 3, North Gut, St. Ann's, N. S.	"	18,006 ft.	50 00
"	"	"	Lot 8, block 20, Forty Mile-Yukon.	Telegraph office.		300 00
"	"	"	Land, Township Hope, Paspébiac, P. Q.	For public road	3,250 ft.	1 00
"	"	"	Lots Nos. 9 and 10, East side Graham St., Woodstock, Ont.	Public building		6,120 00
"	"	"	Bill of sale, Steam Yacht, <i>Speedy the Second</i> ...	(Government) purposes	115 ft. l. 20 ft. w.	35,000 00
Aug.	"	"	Land, Champlain, P. Q.	Site for wharf.	30,638 ft.	1,000 00
"	"	"	Land, Maria Cape, P. Q.	Road and approach.	50,000 ft.	1 00
"	"	"	Land, Abnans River, N. S.	Wharf		60 00
"	"	"	Lots, St. Hyacinthe, P. Q.	Drill shed	5,950 sq. ft.	7,500 00
"	"	"	Land, Iona, N. S.	Wharf	12,000 sq. ft.	500 00
"	"	"	Lots 14 and 15, block J, Lot 78, Prince Albert, N. W. T.	Public building		1,000 00
"	"	"	Land, L'Anse aux Gascons, P. Q.	For approach	40,000 ft.	1 00
Sept.	"	"	Land at Pierreville, P. Q.	Approach to wharf	31 x 245 ft.	600 00
"	"	"	Land, Mille Vaches, P. Q.	Wharf		2 00
"	"	H. P. Baird	Land at Woodstock, N. B.	Armoury		1,250 00
"	"	His Majesty	Bill of Sale, goods and chattels of Dredge No. 8, etc.			6,400 00
"	"	"	Lots Nos. 1432, 4, 5, etc., Sherbrooke, P. Q.	Drill hall	99,175.	6,000 00
"	"	"	Land at Mille Vaches, P. Q.	Approach to wharf	24 ft. wide	1 00
"	"	"	Part of Lot 23 'E' and 23 'B' Grand Mechuins, P. Q.	Wharf	2 rods 21 perch.	50 00
"	"	"	Land, S. side, Gabarus Bay, N. S.	Breakwater	25,780 sup. ft.	60 00
Oct.	"	"	Lots 33, 34, 35, 6, 7, 8, 9, 40, block 31, Brandon, Man.	Drill hall		3,100 00
"	"	"	Land at Musquodabuit, N. S.	Wharf		1 00
"	"	"	Land, Township McLean, Toronto, Ont.	Public wharf	4,450 sq. ft.	1 00
"	"	"	Part lot 10 W. side Hughson St., Hamilton, Ont.	Site for drill hall		5,000 00
"	"	"	Lot No. 87, Ste. Cecile du Bic, P. Q.	Wharf	32 arpents x 30 ft.	800 00
Nov.	"	"	Lot No. 88, Montserrat, P. Q.	Public building	56 x 60 ft.	2,900 00
"	"	"	Right of way, sewer, Richibucto, N. B.			105 00
"	"	"	Two lots at Gabarus, N. B.	Wharf.	36,850 ft.	150 00

## SESSIONAL PAPER No. 19

"	28 S. Signorljornsson.....	"	N. half Sec. 15, T. 21 Arnes, Man.	"	2 <sup>1</sup> / <sub>16</sub> acres.	1 00
"	28 T. Thorvaldsson.....	"	S. " 15, T. 21 " "	"	1 <sup>1</sup> / <sub>16</sub> acres.	1 00
"	30 R. J. Mawhinney et ux.	"	Land, Mace's Bay, N.B.	"	1 <sup>1</sup> / <sub>16</sub> acre	250 00
"	30 S. A. Carpenter and husband.....	"	"	"	"	4,000 00
"	30 Geo. Case et ux.	"	Lots 9 and 10, W. side Hughson St., Hamilton, Ont.	Drill hall.	"	12,000 00
"	30 Ann Gould.....	"	Part lot 10, James St., Hamilton, Ont.	"	"	4,500 00
Dec.	6 P. A. Choquette.....	"	Lot 9, E. side James St., Hamilton, Ont.	Public building	9,240 ft.	20,436 00
"	16 Gilem Robertson.....	"	Lot No. 4438a, Grande Allée, Quebec	"	156 x 120 ft.	52,000 00
"	30 Wm. Carroll et ux.	"	Lots 3, 4, 5, 6, 7, 8, block 15, Vancouver, B.C.	Drill hall.	"	3,500 00
"	31 B. McMartin et ux.	"	Lot 10, James St., Hamilton, Ont.	Postal station 'B	"	14,257 96
1905.	"	"	Lots 8, 9, 10, 11, E. side Yonge St., Toronto, Ont.	"	"	"
Jan.	5 H. Duchesne.....	"	Land, North Plantagenet, Ont., N.W. corner half lots.	Wharf.	"	600 00
"	13 P. P. Morrison.....	"	Lot 55, Launching McPherson's Cove, P.E.I.	"	"	70 00
"	13 L. McPherson et ux.	"	Lot 55, McPherson's Cove, P.E.I.	Postal station.	4,547 <sup>1</sup> / <sub>2</sub> ft.	140 00
"	21 H. M. Molson.....	"	Lots, St. Catherine St., Montreal	"	"	47,743 00
"	25 J. J. Moore & A. S. Desjardins es qualités	"	"	"	"	"
"	26 F. S. McDonald.....	"	Lots S.W. side Cathedral St., Montreal	Public building	98 x 37 ft.	12,000 00
Feb.	2 H. H. Groff et ux.	"	Land, Souris East, P.E.I.	"	"	1,000 00
"	10 P. C. Bosdet.....	"	Lot 'P', s. half lot 'O', easterly 45 ft. lot 'Q', block 95, Shinoe, Ont.	Wharf.	26,324 sq. ft.	2,050 00
"	"	"	Land West Archat Harbour, N.S.	"	1 <sup>1</sup> / <sub>2</sub> acres.	700 00
Feb.	20 Mrs. L. V. Filteau.....	"	Part of lot 1 <sup>1</sup> / <sub>2</sub> of Cadastre, River du Loup, P.Q.	Wharf.	"	9,191 00
"	27 The Lake Manitoba Quarry & Transportation Co., Ltd	"	"	Government purposes.	8 <sup>1</sup> / <sub>16</sub> of acre	9,500 00
Mch.	6 A. J. Henderson.....	"	Bill of sale, tug <i>Carberry</i>	Wharf.	1 <sup>1</sup> / <sub>16</sub>	1 00
"	8 The Supply Co., Ltd	"	Land, Township McLean, Haysville, Ont.	"	"	"
"	10 Episcopal Corporation of Chocomaui.	"	Land at Canning, N.S.	"	"	"
"	20 M. H. Ewing.....	"	Land, Chicoutimi, P. Q.	Site public building	24,000 sup. ft.	2,400 00
"	30 A. F. Healy.....	"	Peel Head Bay, P.Q., strip of land	Wharf	53,928 sq. ft.	1,500 00
April	1 James Burke et ux.	"	Part of lot 5, Sandwich, Ont.	Public building	3,471 sq. ft.	1,700 00
"	1 Frs. A. Myers.....	"	Lot 208, Stratford, Ont.	"	"	2,750 00
"	1 W. A. Moore.....	"	"	"	"	2,850 00
May	1 H. Bonenfant.....	"	Part of lot 269, Stratford, Ont.	"	"	2,500 00
"	1 John Culligan et ux.	"	Bill of sale, tug <i>Nora</i>	Government purposes.	5 <sup>1</sup> / <sub>16</sub> of acre.	1,500 00
"	3 M. A. Kavanagh.....	"	Land at Durham, N.B.	Wharf.	1	1 00
"	15 E. J. Covey.....	"	Lot 731, Cathedral St., Montreal, P.Q.	Postal station.	"	25,000 00
"	15 J. A. Campbell.....	"	Land, Indian Harbour, N.S.	Approach to wharf	1,850 ft.	50 00
"	16 F. A. Hough.....	"	Land at New Richmond, P.Q.	Wharf.	50 x 100 ft.	1 00
"	16 W. C. Kinsley.....	"	Water lot, Anherstburg, Ont.	"	4 <sup>1</sup> / <sub>16</sub> of acre.	250 00
"	22 Andrew H. Green.....	"	Westerly part of lot 7, Anherstburg, Ont.	"	1 acre	500 00
"	22 M. Barrett.....	"	Westerly part of lots 1, 3, Anherstburg, Ont.	"	1 <sup>1</sup> / <sub>16</sub> acres.	500 00
"	27 Corporation of Peterborough.....	"	Water lot, Anherstburg, Ont.	"	1 <sup>1</sup> / <sub>16</sub> of acre	500 00
"	"	"	Lot No. 3, Murray St., Peterborough, Ont.	Armoury	"	1 00
"	"	"	Lots 4, 5, 6, N. Murray St., Peterborough, Ont.	"	"	10,000 00

5-6 EDWARD VII., A. 1906

No. 2.—STATEMENT of properties purchased or sold by the Department of Public Works, &amp;c.—Continued.

Date of Conveyance.	Vendors.	Purchasers.	Description of Property.	For what Purpose.	Area.	Price.
1905.						% cts.
May 31	Isabella Doran.	His Majesty.	Lot No. 108, North Bay, Ont.	Public building.	66 x 132	8,000 00
June 3	Mrs. A. A. Pânt.	"	Lot of land, Port Hawkesbury, N.S.	Wharf.	47,568 sup. ft.	2,950 00
" 5	J. L. Belliveau.	"	Middle East Pubnico, N.S., lots	"	$4\frac{1}{2}$ of acre.	100 00
" 7	Mary E. Park.	"	Water lot, Amherstburg, Ont.	"	1.26 acres.	300 00
" 10	Geo. Mackenzie & ux.	"	Skinner's Cove	"	87,834 ft.	150 00
" 12	S. Pettypiece.	"	" Amherstburg, Ont.	"	$7\frac{1}{2}$ of acre	250 00
" 17	Chs. Boucher & ux.	"	Land, Benoit Cove, St. George's Bay, N.S.	Boat landing	30,683 sup. ft.	1 00
" 19	J. F. Cairns.	"	Lots 30, 31, 32, Saskatoon, N.W.T.	Public building.	5, 60 ft. of lots.	2,000 00

## SESSIONAL PAPER No. 19

No. 3. —STATEMENT of Properties leased to and by the Department of Public Work during the Fiscal Years ended June 30, 1905.

Date of Lease.	Lessor.	Lessee.	Property Leased.	For what Purposes.	Duration of Lease.	Annual Rental.
1904.						\$ cts.
July 20	Alp. Laberge.	His Majesty.	First flat, 4 rooms, Montuigny, P.Q.	Post office.	1 year	275 00
" 25	His Majesty.	C. C. Robinson	Wooden structure, Cape Tormentine, N.B.	Private enterprise.	5 years	1 00
Aug. 24	T. Carpentier.	His Majesty.	Building, St. Catherine St. E., Montreal.	Government purposes.	5 "	600 00
Dec. 31	H. Cornier.	"	Building at Mutton Bay, P.Q.	Telegraph office.	Good pleasure.	75 00
1905.						
Jan. 1	Lewis Estate.	"	Premises at Vancouver, B.C.	Customs & Ex. ware-house.	2½ years	200 00 per mo.
" 14	A. E. Brown.	"	Building, St Antoine St., Montreal.	Immig. purposes.	15 months	1,277 70 whole period.
" 16	Mercantile Bank of Canada	"	Messuage at London, Ont.	Government purposes.	5 years	500 00 p. annum.
" 31	His Majesty.	The Hamilton Cataract Power, Light & Traction Co., Ltd.	Land, Burlington Channel.	Steel towers.	21 "	1 00
Feb. 11	C. T. Daykin.	C. L. McKeen.	Land at St. Andrews Island, N.B.	Private enterprise.	During pleasure.	9 00 p. annum.
Mar. 15	Chs. Sandison.	His Majesty.	Upper floor, warehouse, Lacombe, N.W.T.	Immig. purposes.	10 months	13 00 per mo.
" 20	R. N. Slater <i>et al.</i>	"	Top flat of building, Edmonton, N.W.T.	Court House.	1 year	70 00 "
April 1	R. Dutrek.	"	Building No. 172, Wellington St., Ottawa.	N. W. M.P. store.	5 years	1,140 00 p. annum.
June 23	His Majesty.	A. Rousseau.	Building at Lethbridge, N.W.T.	Immig. purposes.	8 months	10 00 per mo.
" 28	R. A. G. Bell.	His Majesty.	Land at Calumet Slide, Ottawa River.	Mill purposes.	21 years	25 00 p. annum.
			Land of three rooms, Calgary, N.W.T.	Inspector's office.	1 year	420 00 "

J. A. CHASSE,  
*Law Clerk.*DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, Dec. 30, 1905.





LIST  
OF SOME OF THE  
ACTS OF PARLIAMENT  
PASSED AT THE SESSION OF 1905  
HAVING REFERENCE TO THE  
DEPARTMENT OF PUBLIC WORKS OR WORKS UNDER ITS CHARGE



LIST of some of the Public Acts of the Parliament of Canada, passed at the First Session of the Tenth Parliament, closed by Prorogation on the Twentieth day of July, 1905, and having reference to the Public Works Department or works under its charge (4-5 Edward VII.)

Subject.	Full Title of the Statute.	Chapter.	Page in Statute Book.
Sums granted to His Majesty for the financial years ending respectively June 30, 1905, and June 30, 1906, and the purposes for which they are granted.	An Act for granting to His Majesty certain sums of money for the public service of the financial years, ending respectively June 30, 1905, and June 30, 1906. . . . .	2	37
Respecting tenders for works.—Government contracts.	An Act respecting contracts for Government works. . . . .	7	109
Respecting awarding of contracts.	An Act to amend the Public Works Act. . . . .	32	177

J. A. CHASSE,  
*Law Clerk.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, Decemebor 30, 1905.



# NATIONAL ART GALLERY

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## CURATOR'S REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 1905.



## NATIONAL ART GALLERY,

OTTAWA, January 4, 1906.

FRED. GÉLINAS, Esq.,  
Secretary, Department of Public Works,  
Ottawa.

SIR,—I have to report that the following pictures have been purchased by the government for the National Art Gallery of Canada, during the fiscal year 1905 :—

‘Mothers’ Love’ by Paul Peel—for two thousand five hundred dollars (\$2,500).

‘Indian Running Rapids’ by Kriehoff—for three hundred and fifty dollars (\$350).

‘Autumn Scenery’ by Kriehoff—for three hundred and fifty dollars (\$350).  
Water Colour by O’Brien—One hundred dollars (\$100).

‘Street scene in Edinburg’ by Verner—One hundred and thirty dollars (\$130).

‘Rainy day’ by Jose Weiss—Sixteen hundred dollars (\$1,600).

Portrait of Chief Justice Armour by E. Weyby Grier—for seven hundred and fifty dollars (\$750).

During the year, fourteen thousand three hundred and sixty-eight visitors registered.

I have the honour to be, sir,

Your obedient servant,

L. FENNINGS TAYLOR,  
*Curator, National Art Gallery.*





NAMES OF THE CHIEF OFFICERS  
OF THE  
DEPARTMENT OF PUBLIC WORKS  
WITH  
DATES OF APPOINTMENT, ETC., FROM 1841 TO 1905.



## NAMES OF THE CHIEF OFFICERS.

The names with the dates of the appointment, &c., of the principal Officials of the Department of Public Works, from 1841 to 1905.

Names.	Capacity or Office.	Date of Appointment.			
		Served.			
		From	To		
<i>Under Statute 4-5 Vic., Cap. 38.</i>					
CORPORATION BOARD OF WORKS.					
Killaly, Hon. H. H. ....	Chairman .....	Dec.	29, 1841	Oct.	3, 1844
Daly, Hon. D. ....					
Harrison, S. B. ....					
Sullivan, R. B. ....	Members .....	Aug.	17, 1841	"	17, 1841
Davidson, J., Esq. ....					
Begly, Thomas A. ....					
Keefer, Samuel. ....	Secretary .....	Dec.	15, 1841		
Rubidge, F. B. ....	Chief Engineer .....				
	Architect and Assistant Chief Engineer.....				
NEW BOARD OF WORKS.					
Killaly, Hon. H. H. ....	Chairman.....	Oct.	4, 1844	June	8, 1846
Daly, Hon. D. ....					
Draper, Hon. W. H. ....					
Morris, Hon. W. ....	Members .....				
Papineau, Hon. D. B. ....					
<i>Under Statute 9th Vic., Cap. 37, &amp;c.</i>					
Robinson, Hon. W. B. ....	Chief Commissioner.....	June	22, 1846	March	10, 1848
Taché, Hon. E. P. ....	" .....	March	11, 1848	Nov.	26, 1849
Chabot, Hon. J. ....	" .....	Dec.	13, 1849	March	31, 1850
Merritt, Hon. W. H. ....	" .....	April	8, 1850	Feb.	11, 1851
Bourret, Hon. J. ....	" .....	Feb.	12, 1851	Oct.	27, 1851
Young, Hon. John.....	" .....	Oct.	28, 1851	Sept.	22, 1852
Chabot, Hon. J. ....	" .....	Sept.	23, 1852	Jan.	26, 1855
Lemieux, Hon. F. ....	" .....	Jan.	27, 1855	Nov.	25, 1857
Alley, Hon. C. ....	" .....	Nov.	26, 1857	Aug.	1, 1858
Holton, Hon. L. H. ....	" .....	Aug.	2, 1858	"	6, 1858
Sciotte, Hon. L. V. ....	" .....	"	7, 1858	Jan.	10, 1859
Rose, Hon. John. ....	" .....	Jan.	11, 1859	June	12, 1861
Cauchon, Hon. Jos. ....	Commissioner .....	June	13, 1861	May	23, 1862
Tessier, Hon. U. J. ....	" .....	May	24, 1862	"	27, 1863
Drummond, Hon. L. T. ....	" .....	"	28, 1863	July	23, 1863
Laframboise, Hon. M. ....	" .....	July	24, 1863	March	29, 1864
Chapais, J. C. ....	" .....	Mar.	30, 1864	June	30, 1867
Casgrain, Hon. Chas. Eus. ....	Second Commissioner.....	July	9, 1846	Feb.	29, 1848
Cameron, Hon. M. ....	Assistant Commissioner.....	March	11, 1848	"	1, 1850
Wettenhall, James, Esq. ....	" .....	Feb.	2, 1850	April	16, 1850
Bourret, Hon. Jos. ....	" .....	April	17, 1850	Feb.	11, 1851
Killaly, Hon. H. H. ....	" .....	Feb.	12, 1851	May	6, 1859
Keefer, Samuel. ....	Deputy Commissioner.....	May	6, 1859	March	7, 1864
Trudeau, Toussaint.....	" .....	March	8, 1864	May	29, 1868
Begley, Thos. A. ....	Secretary .....	Feb.	10, 1841	Cet.	31, 1858
Trudeau, Toussaint.....	" .....	Dec.	13, 1859	March	7, 1864
Braun, Frederick.....	" .....	March	8, 1864	July	1, 1867
Page, John. ....	Chief Engineer.....	Oct.	31, 1873	Oct.	1, 1879

Names.	Capacity or Office.	Date of Appointment.			
		Served.			
		From		To	
<i>Under Statute 31 Vic., Chap. 12.</i>					
McDougall, Hon. Wm.	Minister.	July	1, 1867	Dec.	7, 1869
Langevin, C.B., Hon. Hector L.	"	Dec.	8, 1869	Nov.	6, 1873
Mackenzie, Hon. Alexander	"	Nov.	7, 1873	Oct.	16, 1878
Tupper, C.B., K.C.M.G., Sir Charles	"	Oct.	17, 1878	May	19, 1879
Langevin, C.B., K.C.M.G., Sir Hector L.	"	May	20, 1879	Aug.	11, 1891
Smith, Hon. Frank	Acting Minister.	Aug.	14, 1891	Jan.	10, 1892
Ouimet, Hon. Joseph Aldric	Minister.	Jan.	11, 1892	April	30, 1896
Desjardins, Hon. Alphonse	"	May	1, 1896	July	12, 1896
Tarte, Hon. J. Israël.	"	July	13, 1896	Oct.	21, 1902
Sutherland, Hon. James	"	Nov.	11, 1902	May	3, 1905
Hymen, Hon. Charles S.	"	May	22, 1905		
Trudeau, Toussaint.	Deputy Minister.	"	29, 1868	Oct.	1, 1879
Baillairgé, G. F.	"	Oct.	4, 1879	Dec.	31, 1890
Gobeil, A., L.S.O.	"	Jan.	1, 1891		
Braun, Frederick.	Secretary.	July	1, 1867	Sept.	30, 1879
Chapleau, S.	"	Oct.	1, 1879	Nov.	4, 1880
Ennis, F. H.	"	Nov.	5, 1880	Jan.	13, 1885
Gobeil, A., L.S.O.	"	Jan.	23, 1885	Dec.	31, 1890
Roy, E.F.E.	"	"	1, 1891	"	31, 1900
Gélinas, Fred	"	June	8, 1901		
McPherson, D. A.	Assistant Secretary.	Jan.	18, 1891	Apr.	11, 1893
Desrochers, Rodolphe Charles.	"	"	8, 1896		
Page, John	Chief Engineer	July	1, 1868	Oct.	1, 1879
Perley, H. F.	"	Nov.	25, 1880	July	10, 1891
Coste, Louis	"	July	26, 1892	March	18, 1899
Lafleur, E. D.	"	Jan.	7, 1905		
Scott, Thos. S.	Chief Architect.	May	26, 1871	Oct.	30, 1881
Fuller, Thomas.	"	Oct.	31, 1881	June	30, 1897
Ewart, David, L.S.O.	"	Nov.	2, 1897		

NAMES

OF THE

OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS OF CANADA

ON JUNE 30, 1905

WITH

DATES OF APPOINTMENT, SALARIES, ETC.

5-6 EDWARD VII., A. 1906

## OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS.

STATEMENT showing the Names, Dates of Appointment, Salaries, &amp;c., of persons employed on the various Slides and Booms, on June 30, 1905.

Name.	Date of Birth.	Position.	Where employed.	Date of Appointment.	Salary.	Remarks.
<i>Collector of Slide and Boom Dues.</i>						
E. T. Smith.	Nov. 26, 1846.	Collector.	Ottawa.	July 1, 1889.	1,900 00 a year.	Date of first appointment to Crown timber office, Ottawa, June 23, 1864. Clerk in Dept. of Inland Rev., July 1, 1870, to June 30, 1889. Transferred to civil list, with rank of first class clerk, January 5, 1892.
F. X. Gagné.	Sept. 23, 1859.	Clerk.	"	Dec. 16, 1897.	1,095 00	Entered the service Aug. 13, 1889.
James Steen.	June 17, 1839.	Boatman.	"	July 12, 1889.	60 00 a month.	Employed during the season of navigation for 8 months each year. Date of first appointment, May, 26, 1861. Timber counter, Ottawa, for Dept. of Inland Revenue, Jan. 7, 1884, to June 30, 1889.
J. Brassard.			"	March 1, 1901.	60 00	Employed during the season of navigation, for 8 months each year.
<i>Saguenay District.</i>						
<i>St. Maurice District.</i>						
L. P. Dallaire.	June 11, 1866.	Paymaster.	Three Rivers.	May 1, 1898.	66 66 a month.	Saguenay district slides abandoned by authority of O.C., dated Feb. 5, 1896 (No. 168,740).
Jos. Page.	July 7, 1845.	Room master.	Mth of St. Maurice.	Dec. 10, 1879.	75 40	
Jos. Dick.	April 13, 1848.	Assc. boom master.	Three Rivers.	April 21, 1898.	75 00	
H. Bourassa.	April 13, 1839.	Boom keeper.	Stc. Flore.	Dec. 2, 1906.	45 50	
Moïse Masson.	Dec. 24, 1846.	Boom master.	Grandes Piles.	April 17, 1898.	75 00	
N. Lyndburner.	July 22, 1885.	"	Shawongigan Falls.	July 1, 1895.	75 00	
A. Paquin.	June 3, 1855.	"	Stc. Flore.	May 2, 1901.	75 00	
<i>Ottawa District.</i>						
G. P. Brophy.	Feb. 24, 1846.	Superintendent.	Ottawa.	July 6, 1873.	2,500 00 a year.	<i>Ottawa Rivers Works</i> —In addition to the above officers, &c., there are employed during the running season, one foreman on slide at \$1.50 and one assistant foreman at \$1.25 a day; also 25 to 30 labourers at \$1 to \$1.40 a working day.
J. K. Kott.	Jan. 28, 1864.	Accountant.	"	Oct. 4, 1901.	1,400 00	
J. C. Scott.	June 27, 1865.	Asst. engineer.	Ottawa.	April 1, 1889.	5 00 a day	
S. F. Smith.	May 25, 1869.	Clerk.	"	Nov. 17, 1904.	2 00	
Wm. Cain.	April 22, 1860.	Messenger.	"	Jan. 1, 1892.	1 50	



## SESSIONAL PAPER No. 19

Pierro St. Pierre.	Mar. 13, 1853.	Deputy slide master.	Carillon	June 1, 1857.	1 40 "	Actively employed about 7 months. Oversees repairs in winter.
D. Noonan.	June 17, 1849.	Boom master.	Gatineau.	Mar. 21, 1878.	500 00 a year.	"
J. Soudiere.	Nov. 8, 1829.	Deputy slide master.	Chaudiere.	" 1878.	3 00 a day.	"
P. D. Chene.	May 6, 1843.	"	Hull.	June 14, 1899.	1 50 "	Employed about 6 months.
W. A. Shere.	Oct. 27, 1842.	"	Chas.	June 26, 1898.	1 50 "	Oversees repairs in winter.
John Harvey.	May 29, 1831.	Slide master.	Arnprior.	July 12, 1882.	2 50 "	Actively employed about 7 months.
Joseph McCraw.	Mar. 26, 1839.	Boom master.	Springtown.	May 15, 1880.	25 00 a month.	Employed about 3 months during season of navigation.
Patrick Barry	" 27, 1858.	Slide master.	High Falls.	Mar. 10, 1888.	1 50 a day.	Employed 5 months during season of navigation. Oversees repairs in winter.
Duncan McLaren.	Jan. 7, 1869.	Deputy slide master.	Portage du Fort.	Sept. 7, 1881.	4 50 25 a year.	"
N. Rochon.	April 2, 1879.	"	Black River.	Mar. 1, 1900.	480 00 "	"
Wm. Selkirk.	May 9, 1849.	"	Lower Petawawa.	Jan. 19, 1900.	2 00 a day.	"
R. Jennings.	April 28, 1843.	"	Upper Petawawa.	Jan. 2, 1905.	2 00 "	"
Wm. Thompson.	May 3, 1843.	"	Mountain.	Oct. 10, 1879.	1 25 "	" 6 mos.
S. Moorhead.	" 3, 1851.	"	Calumet.	Mar. 1, 1901.	1 25 "	" 6 to 7 mos.
John Mullin.	July 27, 1851.	"	Conlonge.	April 10, 1899.	1 50 "	" 4 mos.
T. Castello.	June 13, 1851.	"	Des Juchins.	Mar. 1, 1904.	300 00 a year.	Employed 3 months during season of navigation. Will inspect works when required.
J. F. McGuire.	Dec. 16, 1842.	"	Dumoulin.	May 1, 1897.	2 00 a day.	"
Jas. Carey.	Nov. 13, 1844.	In charge.	Cedar Lake Dam.	April 1, 1901.	2 00 "	"
J. Malheux.	" 28, 1839.	Deputy slide master.	Crooked Chute.	" 3, 1905.	2 00 "	"
A. H. Johnson.	" 28, 1839.	"	Chenaux.	" 1895.	2 50 "	Paid during season of navigation, 7 mos.
<i>Newcastle District.</i>						
S. Clegg.	Oct. 16, 1850.	Superintendent.	Peterborough.	Mar. 1, 1901.	800 00 a year.	Receives \$600 a year from Department of Railways and Canals.
G. H. Giroux.	Feb. 6, 1858.	Clerk, Supt's office.	"	" 1, 1880.	400 00 "	\$250 a year as lock-master, Dept. R. & C.
W. T. Junkin.	Nov. 2, 1867.	Slide master.	Fenelon Fall.	Nov. 15, 1896.	100 00 "	Receives \$190 a year from Department of Railways and Canals.
R. T. Hill.	Aug. 13, 1848.	"	Buckhorn.	July 1, 1891.	100 00 "	"
Hamilton Johnston.	Aug. 20, 1847.	"	Healey's Falls.	" 15, 1892.	200 00 "	"
John Dimwoodie.	May 21, 1847.	"	Lakefield.	June 20, 1893.	150 00 "	Receives \$240 a year from Department of Railways and Canals.
<i>Richelieu District.</i>						
C. Choquette.	"	Boom master.	Beloeil Station.	July 26, 1897.	100 00 "	"
<i>Burlington Channel Spring Bridge.</i>						
Wm. Chandel.	July 6, 1857.	Bridge attendant.	Burlington.	Sept. 19, 1896.	600 00 "	Employed 9 months
W. Hopkins.	June 4, 1846.	" assistant.	"	July 1, 1902.	1 50 a day.	"
H. Campman.	Dec. 14, 1863.	"	"	Sept. 8, 1902.	1 50 "	"
Jas. Eustice.	Feb. 27, 1872.	"	"	" 19, 1896.	1 50 "	"

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STATEMENT showing Names, &c., of persons employed on various works—*Concluded.*

Name.	Date of Birth.	Position.	Where employed.	Date of Appointment.	Salary.	Remarks.
<i>Yamaska Lock.</i>						
O. Mineau .....	July 4, 1844...	Lock keeper .....	Yamaska. ....	1, 1885..	75 00 a month. ...	Employed 9 months.
H. Lambert .....	Aug. 20, 1844...	" .....	" .....	" July 1, 1897..	40 00 " .....	"
<i>Rivière du Lièvre Lock.</i>						
Hugh R. Gorman .....	Sept. 20, 1842...	Lock master .....	Rivière du Lièvre .....	April 15, 1897..	180 00 a year .....	
Charles Brazeau .....	Dec. 23, 1862...	Labourer .....	" .....	Mar. 8, 1902..	35 00 a month. ...	Employed 8 months.
<i>Rivière St. Louis Feeder.</i>						
Julien Monpetit .....	.....	Gate keeper .....	Rivière St. Louis .....	May 11, 1903..	10 00 " .....	

JOS. VINCENT.

NAMES  
OF  
PERSONS EMPLOYED ON THE VARIOUS GRAVING DOCKS  
ON JUNE 30, 1905,  
WITH  
DATES OF APPOINTMENT, SALARIES, ETC.

5-6 EDWARD VII., A. 1906

## GRAVING DOCK EMPLOYEES.

STATEMENT showing the Names, Dates of Appointment, Salaries, &amp;c., of persons employed on the various Graving Docks, June 30, 1905.

Name.	Position.	Where Employed.	Date of Appointment.	Salary.	Remarks.
<i>Esquimalt Graving Dock.</i>					
<i>British Columbia.</i>					
John Doyereux.....	Dockmaster.....	Esquimalt.....	Sept. 17, 1887.....	166 66 a month.....	
John Jeffcott.....	Engineer.....	".....	Jan. 4, 1901.....	100 00 ".....	
E. N. Jones.....	Assistant engineer.....	".....	" 8, 1901.....	80 00 ".....	
A. D. Grieves.....	Carpenter.....	".....	Dec. 1, 1887.....	80 00 ".....	
W. Young.....	Labourer.....	".....	June 1, 1901.....	50 00 ".....	
J. Stock.....	".....	".....	July 1, 1894.....	50 00 ".....	
Chas. Jordan.....	Stoker.....	".....	" 1, 1901.....	60 00 ".....	
G. Springer.....	".....	".....	April 1, 1903.....	60 00 ".....	
J. Young.....	Night watchman.....	".....	June 1, 1903.....	50 00 ".....	
<i>Lévis Graving Dock.</i>					
Alf. Samson.....	Dockmaster.....	Lévis.....	Feb. 15, 1900.....	1,300 00 a year.....	
W. Macdonald.....	Mechanical engineer.....	".....	June 1, 1888.....	75 00 a month.....	
T. Desros.....	Asst. mechanical engineer.....	".....	June 21, 1901.....	60 00 ".....	
Narcisse Lemelin.....	Fireman.....	".....	June 1, 1888.....	40 00 ".....	
<i>Kingston Graving Dock.</i>					
F. S. Rees.....	Dockmaster.....	Kingston.....	April 1, 1897.....	1,000 00 a year.....	
Robert McLeod.....	1st engineer.....	".....	July 1, 1892.....	75 00 a month.....	
Wm. Goughgan.....	Fireman.....	".....	" 1, 1892.....	45 00 ".....	
C. Staley.....	Watchman.....	".....	" 1, 1892.....	45 00 ".....	

JOS. VINCENT.

LIST  
OF  
ENGINEERS, ENGINEMEN, FIREMEN AND CARETAKERS  
EMPLOYED IN THE  
PUBLIC BUILDINGS THROUGHOUT THE DOMINION ON JUNE 30, 1905  
DATES OF APPOINTMENT, SALARIES, ETC.

5-6 EDWARD VII., A. 1906

## ENGINEERS AND CARPENTERS' PUBLIC BUILDINGS.

STATEMENT showing the Names, &c., of the Engineers, Firemen, Carpenters, Hoist Attendants and Watchmen employed at Dominion Public Buildings on June 30, 1905.

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.
						£	cts.	£
Aulbert.	Post office.	J. H. Chapman.	Jan. 1, 1846	Carpenter.	Sept. 1, 1900	33	33	400 00
Antigonish.	Public building.	Angus McDonald.	Nov. 1, 1834	"	June 1, 1905	33	33	400 00
Annapolis.	Post office and custom house.	John McKay.	Oct. 26, 1847	"	April 1, 1891	33	33	400 00
Archie.	Public building.	Mrs. G. DeRoche.		"	May 5, 1905	12	50	150 00
Baddeck.	"	D. F. McKenzie.	May 20, 1848	"	Jan. 21, 1899	20	83	250 00
Dartmouth.	"	I. C. Henley.	Dec. 11, 1846	"	Jan. 22, 1894	20	83	250 00
Digby.	"	F. Doumson.	Nov. 8, 1841	"	Mar. 14, 1902	33	33	400 00
Halifax.	Dominion building.	Richard Power.	Aug. 15, 1834	"	Oct. 1, 1871	62	50	750 00
"	"	J. DeYoung.	Dec. 8, 1860	Engineer.	Nov. 28, 1904	30	00	400 00
"	"	J. F. Sullivan.	April 16, 1866	Fireman.	July 1, 1892	33	33	400 00
"	"	W. H. Gray.	Nov. 26, 1848	Watchman.	Sept. 13, 1901	29	00	400 00
"	"	John Crowell.	Feb. 26, 1852	Engineer.	Dec. 13, 1901	50	00	400 00
"	Drill hall.	R. Morrison.	Mar. 26, 1857	Fireman.	Oct. 4, 1903	50	00	400 00
"	Armouries.	M. O'Neil.	Dec. 30, 1850	Carpenter.	Oct. 1, 1897	37	50	450 00
"	Examining warehouse.	John O'Neil.	Dec. 17, 1856	Fireman.	Feb. 2, 1897	50	00	600 00
"	Immigrant building.	W. Hiltz.	April 17, 1864	Carpenter.	Nov. 1, 1900	33	33	400 00
"	Public building.	James Clements.	June 5, 1853	"	June 27, 1900	33	33	400 00
Kentville.	"	J. E. Hebb.	Nov. 3, 1853	"	"	25	00	300 00
Liverpool.	Post office.	J. A. Mutch.	Dec. 13, 1840	"	Oct. 5, 1901	33	33	400 00
Laureburg.	Public building.	Alex. Green.	July 16, 1825	"	Dec. 1, 1897	41	66	500 00
New Glasgow.	Post office and custom house.	Jas. Arbuckle.	Feb. 18, 1836	"	Dec. 20, 1896	33	33	400 00
North Sydney.	Post office.	J. A. Watt.	Sept. 5, 1849	"	Jan. 1, 1903	33	33	400 00
Pictou.	Post office and custom house.	Mrs. M. Keefe.	Jan. 4, 1850	Carpenter.	April 1, 1897	33	33	400 00
Springhill.	"	Alex. P. Smith.	Mar. 17, 1857	"	Feb. 13, 1899	33	33	400 00
Sidney South.	Post office.	J. A. Meehan.	Nov. 16, 1841	"	Mar. 3, 1894	33	33	400 00
Truro.	Public building.	W. H. Whalen.	Dec. 23, 1841	" & engineer.	April 19, 1875	41	67	500 00
Windsor.	Dominion building.	Geo. Walker.	Jan. 28, 1826	Messenger.	Jan. 24, 1898	45	83	550 00
Yarmouth.	"	M. A. Allan.	Aug. 1, 1853	"	Nov. 1, 1896	45	00	500 00
Charlottetown.	Public building.	Angus McKenzie.	Mar. 12, 1856	Watchman.	May 1, 1904	13	33	160 00
"	Dominion building.	M. Pearson.	Sept. 25, 1835	Carpenter.	Sept. 1, 1897	33	33	400 00
"	Post office.	S. P. Ashely.	Aug. 18, 1873	"	Jan. 1, 1905	33	33	400 00
Montague.	"	"	"	"	"	"	"	"
Summerside.	"	"	"	"	"	"	"	"
Bathurst.	"	"	"	"	"	"	"	"

## SESSIONAL PAPER No. 19

Chatham.	N. B.	Post office.	C. Johnston.	May	18, 1856	Caretaker.	Mar.	27, 1895	25	00	12	months.	300	00
Carlton.	"	"	James K. Reid.	Aug.	15, 1823	"	Oct.	1, 1889	8	33	12	"	100	00
Dalhousie.	"	"	Wm. Gould.	Jan.	1, 1833	"	Nov.	26, 1890	33	33	12	"	400	00
Fredericton.	"	"	L. Farra.	Dec.	18, 1843	"	Dec.	1, 1900	33	33	12	"	400	00
Marysville.	"	"	G. W. Foster.	Feb.	2, 1836	"	July	23, 1903	12	50	12	"	150	00
Moncton.	"	"	E. B. Hicks.	Jan.	11, 1882	"	Jan.	11, 1886	33	33	12	"	400	00
Newcastle.	"	"	Patrick Keating.	Mar.	13, 1840	"	Oct.	23, 1886	33	33	12	"	400	00
Richibucto.	"	"	J. Murray.	Aug.	16, 1839	"	Feb.	1, 1904	33	33	12	"	400	00
St. John.	"	Custom House	Neil J. Morrison.	July	25, 1858	Eng. & caretaker	April	27, 1894	60	00	12	"	720	00
"	"	"	Christopher White.	Nov.	20, 1844	Fremant.	Nov.	9, 1885	50	00	12	"	600	00
"	"	"	James A. Paul.	Aug.	1, 1837	Caretaker.	Oct.	13, 1891	41	67	12	"	500	00
"	"	Post offices.	James Wolfe.	Mar.	22, 1840	Engin.	Dec.	1, 1893	55	00	12	"	680	00
St. Stephen.	"	"	Edward Hancey.	Feb.	22, 1849	Hoist attendant.	Nov.	27, 1882	50	00	12	"	600	00
Sussex.	"	"	Samuel Topping.	April	21, 1840	Caretaker.	May	23, 1887	33	33	12	"	400	00
Woodstock.	"	"	Mrs. N. Dryden.	June	20, 1839	"	Mar.	26, 1901	25	00	12	"	300	00
Bytham.	P. Q.	"	Charles Fraton.	Jan.	20, 1839	"	May	1, 1897	33	33	12	"	400	00
Buckingham.	"	"	A. Bourgeau.	"	23, 1870	"	April	9, 1904	8	33	12	"	100	00
Coastcook.	"	"	T. F. Bisson.	May	23, 1848	"	Feb.	3, 1903	10	00	12	"	120	00
Drummondville.	"	"	Israel Baldwin.	Nov.	16, 1839	"	June	27, 1889	33	33	12	"	400	00
Granby.	"	"	A. Pare.	April	27, 1842	"	June	5, 1902	25	00	12	"	300	00
Fraserville.	"	"	J. A. Beauchemin.	May	1, 1862	"	May	12, 1903	25	00	12	"	300	00
Windsor.	"	Post office.	W. D. Raymond.	Jan.	7, 1876	"	April	14, 1905	25	00	12	"	300	00
Hochelaga.	"	"	J. H. Brown.	Oct.	7, 1851	"	Mar.	27, 1902	16	66	12	"	200	00
Hull.	"	" &c	J. T. Madore.	Dec.	1, 1843	"	"	8, 1900	12	50	12	"	150	00
Joliette.	"	"	A. Ratel.	"	29, 1845	"	Sept.	1, 1897	33	33	12	"	400	00
Lachine.	"	"	P. O. Robert.	Sept.	7, 1846	"	Jan.	26, 1899	8	33	12	"	100	00
Laprairie.	"	"	Jos. Brisson.	Nov.	11, 1859	"	Nov.	22, 1901	12	50	12	"	150	00
L'Assomption.	"	"	E. Arbour.	Dec.	8, 1850	"	July	1, 1904	12	50	12	"	150	00
Montreal.	"	"	J. T. Murphy.	May	6, 1863	Foreman engin. r.	Mar.	2, 1903	100	00	12	"	1,200	00
"	"	Dominion building.	Ed. Lanctot.	April	14, 1857	Caretaker.	Dec.	3, 1898	41	67	12	"	500	00
"	"	"	M. Boyer.	Feb.	18, 1848	Fremant.	Mar.	4, 1882	50	00	12	"	600	00
"	"	"	Att. Lesieur.	June	22, 1868	Caretaker.	April	18, 1905	45	00	12	"	540	00
"	"	Examining warehouse.	Jos. Fergus.	May	15, 1871	Fremant.	Nov.	2, 1904	45	00	12	"	540	00
"	"	"	Jos. Langevin.	Mar.	10, 1850	"	Oct.	18, 1904	45	00	12	"	540	00
"	"	"	G. Labelle.	May	14, 1871	Hoist attendant.	Sept.	12, 1904	50	00	12	"	600	00
"	"	"	S. McGarry.	June	15, 1873	"	"	12, 1904	50	00	12	"	600	00
"	"	"	H. Noville.	Mar.	18, 1849	"	"	2, 1888	50	00	12	"	600	00
"	"	"	H. Marchand.	Sept.	18, 1849	"	Dec.	2, 1888	50	00	12	"	600	00
"	"	"	E. Guernon.	Dec.	23, 1868	"	Oct.	23, 1904	50	00	12	"	600	00
"	"	"	A. Drouin.	June	14, 1868	"	Nov.	23, 1904	50	00	12	"	600	00
"	"	"	Ad. Desjardins.	Sept.	3, 1859	Cleaner.	June	30, 1904	45	00	12	"	540	00
"	"	"	F. Nadon.	June	15, 1847	"	Dec.	15, 1902	48	00	12	"	576	00
"	"	Post office.	F. Green.	Oct.	4, 1857	Engineer.	Jan.	1, 1885	60	00	12	"	720	00
"	"	"	S. N. Nickle.	Dec.	25, 1871	Mech. elect n.	Mar.	1, 1894	70	00	12	"	840	00
"	"	"	F. X. Lefebvre.	"	13, 1859	Asst.	June	28, 1905	55	00	12	"	660	00
"	"	"	L. Trudeau.	Jan.	22, 1863	Caretaker.	Oct.	1, 1902	50	00	12	"	600	00
"	"	"	Oscar Renaud.	Feb.	19, 1867	"	Sept.	15, 1898	50	00	12	"	600	00
"	"	"	Art. Forget.	July	25, 1867	Elevator man.	Dec.	15, 1893	50	00	12	"	600	00
"	"	"	L. Brault.	Dec.	29, 1854	"	Sept.	1, 1901	50	00	12	"	600	00
"	"	"	A. Bourassa.	June	1, 1857	Freight hoist at.	Aug.	4, 1893	50	00	12	"	600	00

5-6 EDWARD VII., A. 1906

STATEMENT showing the Names, &c., of the Engineers, Enginemen, Firemen, Caretakers, Hoist Attendants and Watchmen employed at the Dominion Public Buildings on June 30, 1905—*Continued.*

Place.	Building.	Name.	Date of birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.
						% cts.		% cts.
Montreal.	P. Q.	C. Vachoncourt.	May 17, 1842	Freight hoist at.	Feb. 15, 1864	50 00	12 months.	600 00
"	"	J. Dufresne.	Feb. 2, 1863	Messenger.	Dec. 15, 1893	2 00 p.d.	12 "	730 00
"	"	Louis St. Jean.	Sept. 17, 1840	Fireman.	July 16, 1892	50 00	12 "	600 00
"	"	C. Daudin.	June 15, 1843	Caretaker.	July 16, 1892	37 50	12 "	450 00
"	"	H. Valjeunesse	Dec. 30, 1871	Carpenter.	Feb. 1, 1904	52 00	12 "	624 00
"	"	B. LaJeunesse	Nov. 20, 1861	Fireman.	Nov. 23, 1896	50 00	12 "	600 00
"	"	J. Gagnier	April 20, 1867	Engineman.	Feb. 14, 1899	45 00	12 "	540 00
Quebec.	"	J. Doherty	Feb. 9, 1865	Fireman.	Dec. 15, 1903	45 00	8 "	340 00
"	"	D. P. Kennedy	Feb. 25, 1871	Engineer.	April 1, 1897	75 00	12 "	900 00
"	"	T. P. McLaughlin	Aug. 13, 1861	Fireman.	July 26, 1892	53 33	12 "	640 00
"	"	James O'Neil.	Nov. 1, 1848	"	Aug. 1, 1894	45 00	12 "	540 00
"	"	John R. Monahan	Nov. 1, 1848	"	Nov. 10, 1888	45 00	12 "	540 00
"	"	J. Roy.	Feb. 25, 1836	Caretaker.	Sept. 1, 1897	53 33	12 "	700 00
"	"	F. J. Cooper	July 8, 1858	Fireman.	June 25, 1895	53 00	12 "	640 00
Peribacca.	"	E. Roy	Dec. 14, 1877	Caretaker.	Oct. 1, 1902	25 00	12 "	300 00
Roberval.	"	J. B. Carboneau	Aug. 12, 1864	"	Nov. 20, 1901	25 00	12 "	300 00
Rimouski.	"	A. LePage	Feb. 7, 1866	"	Jan. 1, 1901	12 50	12 "	150 00
Richmond.	"	H. Desmarais	July 14, 1869	"	May 7, 1898	25 00	12 "	300 00
Sherbrooke	"	O. Desève	Aug. 6, 1848	"	April 2, 1898	33 33	12 "	400 00
Sorel.	"	C. Robitaille	Jan. 22, 1848	"	Sept. 1, 1897	40 00	12 "	480 00
Saint Henri	"	A. C. A. Bissonnette	May 25, 1858	"	Mar. 4, 1895	33 33	12 months.	400 00
Saint Hyacinthe.	"	E. N. Tétrault	Nov. 8, 1846	"	Aug. 5, 1892	33 33	12 "	400 00
"	"	E. Clapin	April 3, 1844	"	July 13, 1904	33 33	12 "	400 00
Saint Jean.	"	L. Forant	Jan. 21, 1849	"	April 14, 1897	23 16	12 "	280 00
Saint Jérôme.	"	J. Savard	Oct. 24, 1859	"	Sept. 1, 1900	33 33	12 "	400 00
St. Louis du Mile End	"	M. A. Campeau	Mar. 6, 1846	"	May 28, 1905	16 66	12 "	200 00
Trois Rivières.	"	Ph. Gravelle	June 3, 1850	"	Feb. 1, 1898	25 00	12 "	300 00
"	"	A. Gauthier	Feb. 4, 1850	"	"	33 33	12 "	400 00
Valleyfield.	"	J. B. Laniel	Oct. 20, 1862	"	"	33 33	12 "	400 00
Victoriaville.	"	G. Deaudet	Feb. 26, 1862	"	Mar. 3, 1904	6 25	12 "	75 00
Annersburg.	Ont.	Wm. R. Elliott	Feb. 20, 1862	"	June 6, 1905	33 33	12 "	400 00
Aluonite	"	Mrs. Monlton	Mar. 23, 1859	"	Jan. 29, 1901	33 33	12 "	400 00
Armory	"	R. B. McCreary	Jan. 11, 1862	"	Mar. 15, 1899	33 33	12 "	400 00
Brookville	"	I. Purvis	Sept. 12, 1826	"	Dec. 15, 1900	33 33	12 "	400 00
Brauford	"	John Squire	April 24, 1842	"	Oct. 27, 1880	50 00	12 "	600 00
Barrie	"	E. Stivigny	Mar. 19, 1847	"	May 1, 1903	41 66	12 "	500 00



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Belleville	"	"	S. Haight	Aug. 26, 1857	"	Jan. 24, 1901	50 00	12	600 00	
Berlin	"	"	J. Clements	June 21, 1840	"	May 15, 1900	33 33	12	400 00	
Brampton	"	"	James McBride	Oct. 5, 1840	"	Jan. 29, 1901	33 33	12	100 00	
Carlton Place	"	"	Jas. E. Halliwell	April 17, 1848	"	May 13, 1885	25 00	12	300 00	
Chatham	"	"	W. W. Mitchell	May 25, 1848	&c.	Jan. 7, 1885	41 66	12	500 00	
Cornwall	"	"	R. Conroy	Nov. 6, 1848	"	April 1, 1897	33 33	12	50 00	
Cayuga	"	"	G. A. Gibson	May 29, 1861	"	Sept. 3, 1891	4 16	12	50 00	
Clinton	"	"	J. Scott	Jan. 21, 1826	"	Feb. 4, 1904	4 16	12	50 00	
Cobourg	"	"	John Boyd	Jan. 18, 1826	"	Aug. 1, 1901	33 33	12	400 00	
Deseronto	"	"	M. Hart	Dec. 5, 1833	"	July 1, 1903	33 33	12	400 00	
Dundas	"	"	W. M. Graham	Dec. 5, 1833	"	"	4 16	12	50 00	
Fort William	"	"	D. J. MacCallum	April 5, 1834	Caretaker	Sept. 21, 1904	33 33	12	400 00	
Galt	Ont.	"	T. Barrett	June 17, 1861	Caretaker	Aug. 1, 1902	33 33	12	400 00	
Geoff.	"	"	R. MacLeod	July 30, 1865	"	May 25, 1901	33 33	12	100 00	
Guelp.	"	"	G. Bissett	April 14, 1851	"	Sept. 1, 1897	33 33	12	400 00	
Goderich	"	"	&c.	"	"	"	33 33	12	600 00	
Hamilton	"	"	Alfred Bernard	Dec. 27, 1847	"	Dec. 10, 1894	50 00	12	400 00	
"	"	"	J. Wigglesworth	Aug. 7, 1863	Fireman	Oct. 1, 1896	50 00	8	400 00	
"	"	"	Thomas Nicholson	Dec. 17, 1857	Engineer	Oct. 2, 1887	50 00	12	600 00	
Inland revenue building	"	"	C. Blackman	May 23, 1860	Caretaker	Mar. 9, 1905	12 00	12	144 00	
Public building	"	"	John McDonald	June 30, 1851	"	Jan. 20, 1900	33 33	12	400 00	
R. Military College	"	"	T. Harrison	Aug. 21, 1875	Fireman	May 1, 1902	45 71	7	320 00	
Armoury	"	"	F. Forsythe	Nov. 15, 1866	Engineer	Feb. 11, 1904	50 00	12	900 00	
R. Military College	"	"	W. F. Hazlett	May 27, 1874	"	Nov. 20, 1900	75 00	12	600 00	
"	"	"	J. Quigley	Oct. 30, 1857	Fireman	June 1, 1903	55 00	12	540 00	
"	"	"	M. Redmond	"	"	Jan. 20, 1902	45 00	12	540 00	
"	"	"	L. Cochran	Mar. 1, 1879	Electrician	July 15, 1905	55 00	12	650 00	
Post office	"	"	Jas. Kohne	June 21, 1873	Caretaker	May 15, 1905	33 33	12	400 00	
Custom house	"	"	M. Mulken	Sept. 4, 1857	Engineer	Sept. 18, 1888	50 00	12	600 00	
"	"	"	Wm. Greer	Oct. 12, 1859	Caretaker	Mar. 16, 1884	33 33	12	400 00	
Post office	"	"	John Price	"	6, 1856	Engineer	Jan. 14, 1884	50 00	12	600 00
Drill hall	"	"	A. Maclean	Nov. 21, 1851	"	Dec. 1, 1904	60 00	12	720 00	
Post office and C. house	"	"	Wm. Galbraith	Jan. 8, 1841	Caretaker	Nov. 17, 1893	33 33	12	400 00	
"	"	"	Mrs. C. E. Webster	July 12, 1846	"	Oct. 1, 1901	33 33	12	400 00	
"	"	"	Wm. J. Sheppard	Jan. 4, 1854	"	Oct. 15, 1897	33 33	12	400 00	
"	"	"	D. McPherson	April 30, 1851	"	July 15, 1900	33 33	12	400 00	
"	"	"	John Fawley	Mar. 14, 1844	"	Nov. 1, 1898	25 00	12	300 00	
Public building	"	"	Sam Lee	Mar. 14, 1842	"	July 7, 1902	33 33	12	300 00	
Post office	"	"	John Irwin	May 17, 1842	"	Sept. 8, 1887	25 00	12	300 00	
Custom house	"	"	Wm. Taylor	Nov. 25, 1839	"	Jan. 26, 1889	25 00	12	300 00	
Post office	"	"	James Shaw	June 11, 1842	"	Sept. 12, 1902	33 33	12	400 00	
Public building	"	"	D. Welbanks	Feb. 8, 1830	"	April 11, 1904	33 33	12	400 00	
"	"	"	John Whitehead	April 15, 1839	"	Sept. 11, 1893	25 00	12	300 00	
Post Office	"	"	Wm. Armstrong	Sept. 9, 1846	"	June 11, 1888	20 00	12	240 00	
"	"	"	Jos. Curils	"	"	May 1, 1905	33 33	12	400 00	
Public building	"	"	Samuel Hamilton	June 4, 1834	"	Oct. 29, 1890	33 33	12	400 00	
Post office	"	"	R. Birks	April 6, 1822	"	May 7, 1899	33 33	12	400 00	
Public building	"	"	Mrs. J. Link	May 10, 1850	"	Dec. 7, 1901	33 33	12	400 00	
"	"	"	J. H. Doble	Aug. 25, 1860	"	Nov. 7, 1903	33 33	12	400 00	
"	"	"	P. W. Lewis	Jan. 19, 1863	"	Jan. 8, 1896	33 33	12	400 00	
Post office, &c.	"	"	J. P. Murray	July 29, 1855	Engineer	"	25, 1900	12	600 00	

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STATEMENT showing the Names, &c., of the Engineers, Enginemen, Firemen, Caretakers, Hoist Attendants and Watchmen employed at the Dominion Public Buildings, &c.—*Continued.*

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each year.	Yearly Salary.
						\$ cts.		\$ cts.
St. Catharines.....	Post Office, &c.....	A. Clark.....	Sept. 14, 1860	Caretaker.....	Dec. 12, 1904	33 33	12 months	400 00
St. Thomas.....	"	G. Lotton.....	May 25, 1857	"	April 14, 1903	33 33	12 "	400 00
Strathroy.....	Public building.....	Wm. J. Johnston.....	May 12, 1840	"	Oct. 25, 1890	33 33	12 "	400 00
Toronto.....	Dominion buildings.....	H. E. Hamilton.....	April 14, 1838	Foreman, engineer	April 10, 1902	100 00	12 "	1,200 00
"	Inland revenue building	C. H. Badlie.....	Sept. 22, 1852	Fireman.....	Jan. 13, 1891	55 00	12 "	660 00
"	Custom house.	Fred. Faragher.....	Oct. 16, 1865	"	Nov. 1, 1889	55 00	12 "	660 00
"	"	Ed. Switzer.....	" 10, 1866	Hoist attendant.	Aug. 18, 1901	55 00	12 "	660 00
"	Examining warehouse.	James Cosgrove.....	Feb. 10, 1844	Engineer.....	Dec. 28, 1874	70 00	12 "	840 00
"	"	Ed. Appleton.....	Sept. 26, 1864	Fireman.....	Sept. 23, 1886	50 00	12 "	720 00
"	"	Alexander Day.....	Dec. 19, 1851	"	Dec. 1, 1887	50 00	12 "	600 00
"	"	Wm. Chenev.....	Jan. 8, 1859	"	Sept. 1, 1903	50 00	12 "	600 00
"	"	F. Simpson.....	Nov. 10, 1853	Watchman.....	April 4, 1902	50 00	12 "	600 00
"	"	Thos. Jones.....	Nov. 26, 1872	Hoist attendant.	Oct. 17, 1901	50 00	12 "	600 00
"	Union station.....	J. Gornally.....	Feb. 27, 1858	Elevatorman.....	April 11, 1904	50 00	12 "	600 00
"	"	G. H. Armstrong.....	Feb. 17, 1864	Caretaker.....	Jan. 12, 1894	55 00	12 "	660 00
"	P. O. Station	James Rae.....	April 8, 1855	Engineer.....	Oct. 9, 1897	50 00	8 "	400 00
"	Post office.	George Latray.....	May 20, 1858	Fireman.....	Nov. 1, 1896	55 00	8 "	440 00
"	"	W. J. Graham.....	Mar. 16, 1840	"	Oct. 1, 1896	55 00	8 "	440 00
"	"	J. C. Davidson.....	May 21, 1876	Elevatorman.....	April 11, 1903	45 00	12 "	540 00
"	Junction	J. Devins.....	July 18, 1847	Caretaker.....	Feb. 3, 1905	33 33	12 "	400 00
"	Drill hall.....	Richard Eyre.....	Oct. 11, 1849	Fireman.....	Mar. 25, 1895	50 00	12 "	600 00
"	"	D. Ghoma.....	Aug. 8, 1897	"	Oct. 1, 1898	50 00	12 "	600 00
"	Public building.	David Allan.....	Aug. 8, 1897	"	Aug. 31, 1889	33 33	12 "	400 00
"	Public building.	Mrs. T. Gibson.....	May 13, 1844	Caretaker.....	May 12, 1905	33 33	12 "	400 00
"	Post office.	L. Belleperche.....	Oct. 26, 1848	Engineman.....	Dec. 24, 1897	50 00	8 "	400 00
"	"	W. Curtis.....	Mar. 6, 1844	Caretaker.....	Nov. 9, 1880	53 33	12 "	400 00
"	Drill hall.....	W. Wheeler.....	Sept. 26, 1874	Engineer.....	Jan. 9, 1905	50 00	8 "	400 00
"	Public Building	Robert Kerr.....	June 6, 1864	"	Dec. 11, 1901	33 33	12 "	400 00
"	"	T. Giles.....	Mar. 30, 1843	"	Aug. 1, 1897	50 00	12 "	600 00
"	"	J. S. Teller.....	July 25, 1840	"	July 1, 1904	45 00	12 "	540 00
"	Post office	Jos. Hay.....	May 4, 1853	Engineman.....	Nov. 26, 1905	75 00	12 "	900 00
"	"	John Mikulecky.....	" 6, 1879	Fireman.....	Nov. 13, 1900	55 00	12 "	660 00
"	"	Joseph Cortu.....	" 10, 1843	Hoist attendant.	Mar. 16, 1887	55 00	12 "	660 00
"	"	A. Boiteau.....	Sept. 23, 1860	Watchman.....	April 4, 1905	55 00	12 "	660 00
"	"	P. Johnson.....	May 31, 1881	Caretaker.....	Oct. 19, 1901	45 00	8 "	540 00

## SESSIONAL PAPER No. 19

[illegible]

JOS. VINCENT.



# OFFICIAL CORRESPONDENCE

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DEPARTMENT OF PUBLIC WORKS

FROM

JULY 1, 1867, TO JUNE 30, 1905.



## OFFICIAL CORRESPONDENCE.

LETTERS Received and Sent from July 1, 1867, to June 30, 1905.

Year.		Received.	Sent.
1867—From July 1 to December 31.....		2,075	1,511
1868 " January 1 to December 31 .....		3,498	2,317
1869 " " " .....		3,448	2,171
1870 " " " .....		4,961	3,185
1871 " " " .....		6,268	3,983
1872 " " " .....		8,333	4,428
1873 " " " .....		10,072	5,707
1874 " " " .....		9,800	5,043
1875 " " " .....		9,006	5,006
1876 " " " .....		7,971	4,773
1877 " " " .....		7,517	4,425
1878 " " " .....		6,886	4,021
1879 " " to October 6.....		7,186	4,547
1879 " October 7 to December 31.....		2,033	810
1880 " January 1 .....		8,451	4,411
1881 " " " .....		9,599	5,529
1882 " " " .....		10,505	5,699
1883 " " " .....		11,633	6,227
1884 " " " .....		13,114	6,903
1885 " " " .....		8,977	5,321
1886 " " " .....		9,644	5,352
1887 " " to June 30.....		4,866	2,735
1887 " July 1 " 1888.....		10,493	6,343
1888 " " " 1889.....		10,522	7,042
1889 " " " 1890.....		10,098	7,448
1890 " " " 1891.....		10,576	7,286
1891 " " " 1892.....		11,637	6,700
1892 " " " 1893.....		11,720	6,220
1893 " " " 1894.....		9,517	6,028
1894 " " " 1895.....		10,190	5,148
1895 " " " 1896.....		10,223	5,573
1896 " " " 1897.....		10,404	5,033
1897 " " " 1898.....		9,640	5,250
1898 " " " 1899.....		9,639	4,784
1899 " " " 1900.....		12,139	5,938
1900 " " " 1901.....		13,179	6,255
1901 " " " 1902.....		15,880	5,067
1902 " " " 1903.....		13,140	6,873
1903 " " " 1904.....		11,300	5,878
1904 " " " 1905.....		11,940	6,461

